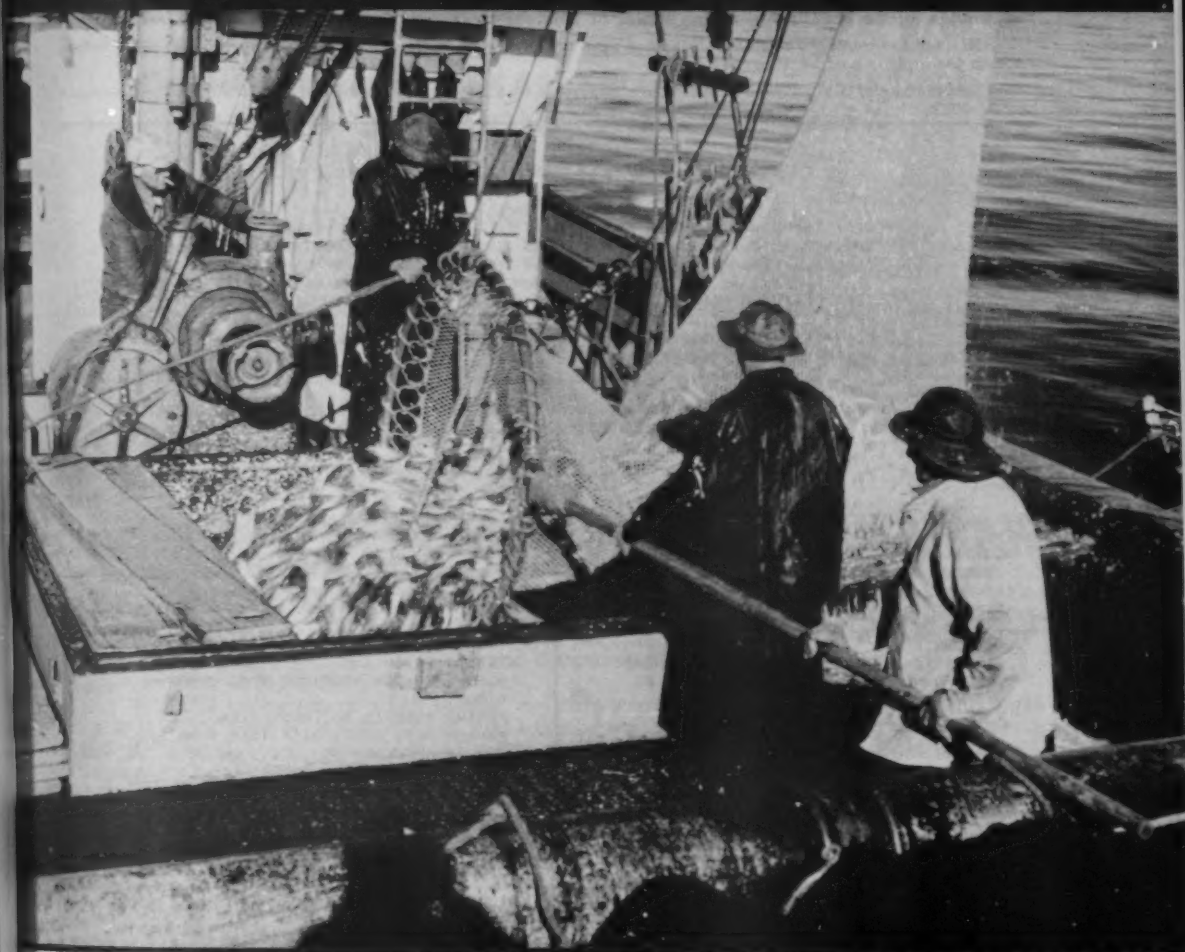


COMMERCIAL FISHERIES REVIEW



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NOVEMBER 1953

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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES



A. W. Anderson, Editor

F. F. Johnson, Associate Editor

J. Pileggi and J. J. O'Brien, Assistant Editors

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CONTENTS

COVER: HERRING (BRAILED FROM THE SEINE ALONGSIDE THE VESSEL) BEING SPILLED INTO THE HOLD OF A HERRING PURSE SEINER IN SOUTHEASTERN ALASKA. EXPLORATIONS TO DETERMINE THE FEASIBILITY OF WINTER HERRING FISHING IN THAT AREA WERE CONDUCTED BY THE SERVICE'S EXPLORATORY FISHING VESSEL JOHN N. COBB IN THE WINTER OF 1952/53. NUMEROUS CONCENTRATIONS OF HERRING WERE NOT FOUND, BUT THIS DOES NOT ELIMINATE THE POSSIBILITY OF DEVELOPING A WINTER HERRING FISHERY IN THE AREA. (SEE PAGE 1.)

	PAGE		PAGE
SOUTHEASTERN ALASKA EXPLORATORY HERRING FISHING OPERATIONS, WINTER 1952/53, BY LAWRENCE N. KOLLOEN AND KEITH A. SMITH	1		
* * * * *			
RESEARCH IN SERVICE LABORATORIES:	25	TRENDS AND DEVELOPMENTS (CONTD.):	
TRENDS AND DEVELOPMENTS:	26	U. S. FOREIGN TRADE IN EDIBLE FISHERY PRODUCTS, JULY 1953	35
ADDITIONS TO THE FLEET OF U. S. FISHING VESSELS	26	WHOLESALE PRICES, SEPTEMBER 1953	35
ALASKA:		FISHERY PRODUCTS MARKETING PROSPECTS, OCTOBER-DECEMBER 1953 AND OUTLOOK FOR 1954	37
CANNED SALMON PACK, 1953	26	FOREIGN:	38
CAUSES OF FAILURE OF PINK SALMON RUNS	27	INTERNATIONAL:	
CALIFORNIA:		INTER-AMERICAN TROPICAL TUNA COMMISSION:	
MID-WATER TRAWL TESTED AND NEW SHRIMP BED FOUND BY <u>N. B. SCOFIELD</u> (CRUISE 53-S-3)	27	PANAMA ADHERES TO CONVENTION	38
<u>N. B. SCOFIELD</u> TAGS MORE ALBACORE (CRUISE 53-S-4)	28	PANAMA LETS COSTA RICA TAKE TUNA BAIT FOR TRANSPLANTING	38
SARDINE ABUNDANCE SURVEY BY <u>YELLOWFIN</u> (CRUISE 53-Y-7)	29	ARGENTINE REPUBLIC:	
PACIFIC HAKE FOR MEAL AND OIL	30	JAPANESE FISHING VESSELS AND PROCESSING FACILITIES TO BE IMPORTED	39
CHESAPEAKE BAY STATES FORM FIN-FISH CONSERVATION COMMISSION	31	BURMA:	
FEDERAL PURCHASES OF FISHERY PRODUCTS .	31	BURMESE-JAPANESE FIRMS PLAN JOINT FISHING ENTERPRISE OFF BURMA	39
GEAR RESEARCH AND DEVELOPMENT:		CANADA:	
UNDERWATER LISTENING EXPERIMENTS NEAR SCHOOLS OF MENHADEN AND LITTLE TUNA .	32	BRITISH COLUMBIA SALMON PACK UP	40
GULF EXPLORATORY FISHERY PROGRAM:		COLOMBIA:	
BLUEFIN TUNA CAUGHT IN NORTHERN GULF OF MEXICO BY <u>OREGON</u>	32	NAVY TO CONTROL OCEAN FISHING	40
MAINE:		FORMOSA (NATIONALIST CHINA):	
SHORT SARDINE PACK INDICATED	32	FISHERIES STATUS	41
NEW ENGLAND TUNA EXPLORATIONS:		FRANCE:	
<u>MARJORIE PARKER</u> LOCATES BLUEFIN TUNA IN OFFSHORE WATERS (CRUISE 3)	33	SALT COD FISHERY FACING CRISIS	42
PACIFIC OCEANIC FISHERY INVESTIGATIONS:		GREECE:	
LARGE SKIPJACK TUNA CONCENTRATIONS FOUND IN HAWAIIAN AREA BY <u>HUGH M. SMITH</u> (CRUISE 22)	33	VESSEL TRAWLS AT 380-FATHOM DEPTH	42
SOUTH PACIFIC FISHERY INVESTIGATIONS:		INDIA:	
SARDINE (PILCHARD) LARVAL MORTALITY STUDY	34	TUNA FISHERY IN SOUTHWEST AREA	42
		INDONESIA:	
		ECA-SUPPLIED FISHING VESSELS OPERATE WELL	43
		JAPAN:	
		CANNED TUNA EXPORT PRICES RISE AGAIN ..	44

CONTENTS CONTINUED ON PAGE 65

COMMERCIAL FISHERIES REVIEW

November 1953

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Vol. 15, No. 11

SOUTHEASTERN ALASKA EXPLORATORY HERRING FISHING OPERATIONS, WINTER 1952/53

By Lawrence N. Kolloen* and Keith A. Smith**

CONTENTS

	PAGE		PAGE
SUMMARY	1	HERRING BEHAVIOR, WINTER AND SUMMER	11
BACKGROUND INFORMATION	3	TAGGING	12
SCOPE OF EXPLORATIONS BY THE JOHN N. COBB	5	PROSPECTS FOR FUTURE WINTER OPERATIONS	14
SCOPE OF EXPLORATIONS BY COMMERCIAL VESSELS ..	6	APPENDIX A - ALASKA HERRING FISHING GEAR AND	
RESULTS	6	ITS OPERATION	19
OCCURRENCE OF HERRING	6	MODIFICATIONS AND GEAR ON JOHN N. COBB.....	19
LENGTH AND WEIGHT OF HERRING	8	TYPICAL SEINING OPERATION	19
AGE OF HERRING	8	APPENDIX B - JOHN N. COBB FISHING LOG FOR	
OIL CONTENT	9	CRUISE 14	21
WEATHER AND EFFECT ON OPERATIONS	11	ACKNOWLEDGEMENTS	23

SUMMARY

Explorations to determine the feasibility of winter herring fishing in Southeastern Alaska were conducted in the winter of 1952/53. Under a cooperative program between the U. S. Fish and Wildlife Service and the Alaska herring industry, the exploratory fishing vessel John N. Cobb explored the waters of Southeastern Alaska between November 4 and December 19, 1952. An amendment to the Alaska fishery regulations permitted the operation of four commercial herring seiners in the waters south of 55°N. latitude between November 9, 1952, and February 11, 1953.

With the exception of a few areas, herring were not found to be abundant during this period. The John N. Cobb did not find herring on the grounds customarily exploited by the summer fishery. Although indications of herring were obtained in Port Camden, Seymour Canal, George Inlet, Silver Bay, Tongass Narrows, and Kendrick Bay, only in the latter three localities were there indications of abundance. The catch of the commercial seiners was approximately 30,000 barrels, 68 percent of which came from Kendrick Bay. Catches were also made in McLean Arm, Foggy Bay, Nakat Bay, Boca de Quadra, and Yes Bay. The most significant concentration of herring was in Tongass Narrows, which was closed by regulation to fishing for reduction purposes.

Herring from Kendrick Bay (which provided the bulk of the catch) were small. Fairly large herring were obtained from the localities of Foggy Bay, Nakat Bay, and Boca de Quadra. The Tongass Narrows herring were of mixed size, averaging much larger than those of Kendrick Bay, but not equal in size to those of Nakat Bay.

Herring in their second year of life were predominant in the catch from Kendrick Bay. The Foggy Bay, Nakat Bay, and Boca de Quadra catches showed a greater spread of ages with a predominance of 3-year and 6-year fish. The Tongass Narrows fish were of mixed age, ranging from 1 to 6 years.

Laboratory analysis showed the winter herring to be approximately 13½ percent oil by weight. The oil yield of slightly less than 3 gallons per barrel of raw fish processed,

* FISHERY RESEARCH BIOLOGIST, BRANCH OF FISHERY BIOLOGY, SEATTLE, WASH.
** FISHERY METHODS AND EQUIPMENT SPECIALIST, EXPLORATORY FISHING AND GEAR DEVELOPMENT SECTION, BRANCH OF COMMERCIAL FISHERIES, SEATTLE, WASH.

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which was obtained in the commercial operations, was less than the 5 gallons normally obtained in the summer operations. No increase in oil content was noted with increased age, as has been the experience in the summer catch.

During November and December, unusually mild weather prevailed in Southeastern Alaska. Interruptions to fishing by weather in the commercial operations amounted to 30 days, or roughly one-third of the operating period.

It was observed that in winter the herring tend to stay at much greater depths than in the summer period, which suggests that the use of deeper nets, such as employed in the Canadian fishery, may be necessary for successful winter fishing.

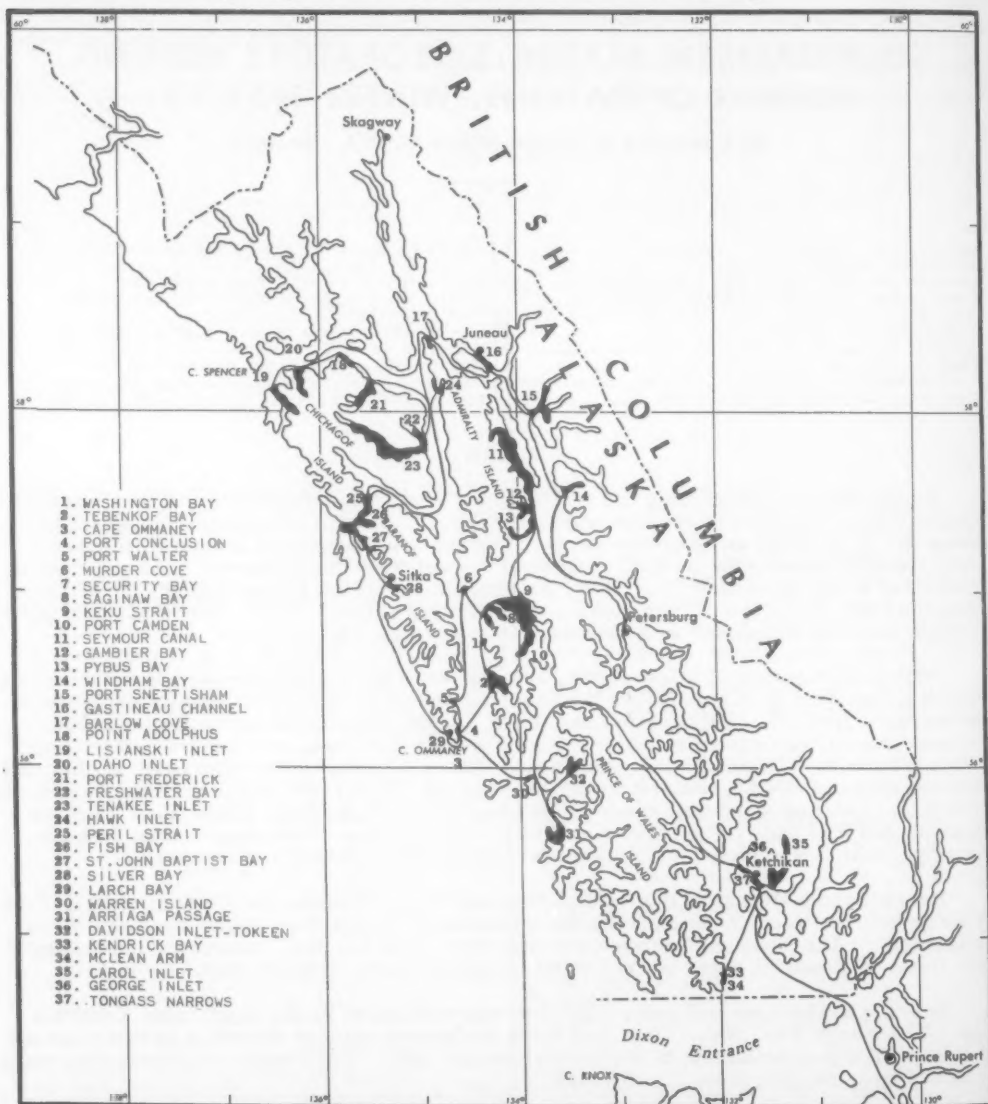


FIG. 1 - AREAS EXPLORED FOR HERRING BY JOHN N. COBB, SOUTHEASTERN ALASKA, WINTER 1952. LINES SHOW COURSES RUN WITH ECHO SOUNDER IN OPERATION.

A total of 5,397 herring were tagged with internal belly tags to determine if there is a southward migration of Southeastern Alaska herring into British Columbia. Eight recoveries have been made to date, but these recoveries have all come from the same locality in which the fish were tagged, and furnish no information on migration. The British Columbia fishery did not operate in the season of 1952/53, so that chances for recovery in that area have been lost for this season.

These explorations did not result in finding numerous concentrations of herring, but do not eliminate the possibility of developing a winter herring fishery in this area. Where herring were found, they were abundant, as shown by the high average catch per set of the commercial boats. Had the herring in Tongass Narrows been available to the fishery, the commercial operations would have been more successful. Tongass Narrows appears to be comparable to Ogden Channel in northern British Columbia as an assembly area of the prespawning schools. The Ogden Channel area contributed 480,000 barrels to the British Columbia herring catch in 1951/52. Whether the herring industry will venture further winter operations in Southeastern Alaska will depend on the market for fishery byproducts.

BACKGROUND INFORMATION

A matter of great interest to those concerned with the Alaska herring fishery has been the sustained high production in British Columbia contrasted to the recent low production in Southeastern Alaska. For the five-year period from 1948 through 1952, the catch in British Columbia has been approximately 11 times that of Southeastern Alaska.

British Columbia and Southeastern Alaska Herring Catches, 1947/48-1951/52 Seasons			
British Columbia		Southeastern Alaska	
Season	Catch	Season	Catch
	Short Tons		Short Tons
1951/52	198,000	1952	17,600
1950/51	187,300	1951	14,100
1949/50	183,200	1950	15,700
1948/49	190,100	1949	17,700
1947/48	171,700	1948	18,700

Although fishing effort in British Columbia has exceeded that in Southeastern Alaska, this alone does not satisfactorily explain the marked difference in production. The poor catches in Southeastern have been caused primarily by a scarcity of herring

resulting either from reduced abundance or reduced availability. Under these circumstances it is doubtful that any increase in fishing effort would have resulted in a marked improvement of the catch.

Because these areas are in adjacent geographical positions and presumably have similar conditions of environment, it would be natural to expect comparable productive capacity and at least similar patterns of abundance.

It has been suggested that the difference in production may be due to the difference in fishing season. British Columbia herring are fished from November to the middle of March; those of Alaska from June through September. British Columbia investigators believe that their major herring populations are offshore in summer and do not become available inshore until the prespawning runs of late fall and winter. This has been confirmed, at least insofar as one population is concerned, by exploratory catches made on Swiftsure Bank in July 1953. Tag recoveries revealed that these fish had been tagged during the spring spawning period in the inshore waters of Barkley Sound. Obviously, a summer fishery confined only to shore areas would have missed these fish entirely.

Similarly, an offshore movement by Alaska herring might cause these populations to escape the summer fishery which is conducted relatively close to shore. In this event the fluctuations in the summer catches might be influenced more by annual or cyclic variation in the offshore movements than by actual changes in abundance.

It has also been suggested that the declining yields in Southeastern Alaska coincident with increasing yields in British Columbia have been caused by changes in migratory pattern. Alaska fishermen have expressed the opinion that the Southeastern Alaska herring are now bypassing that area in favor of British Columbia waters. This theory presumes a southward migration of the Southeastern Alaska herring stocks.

In British Columbia in recent years the high production in the northern subdistrict has contributed materially to the success of the herring fishery. Following good yields (chiefly from the Prince Rupert area) in the period of 1937-1942, production in this sub-

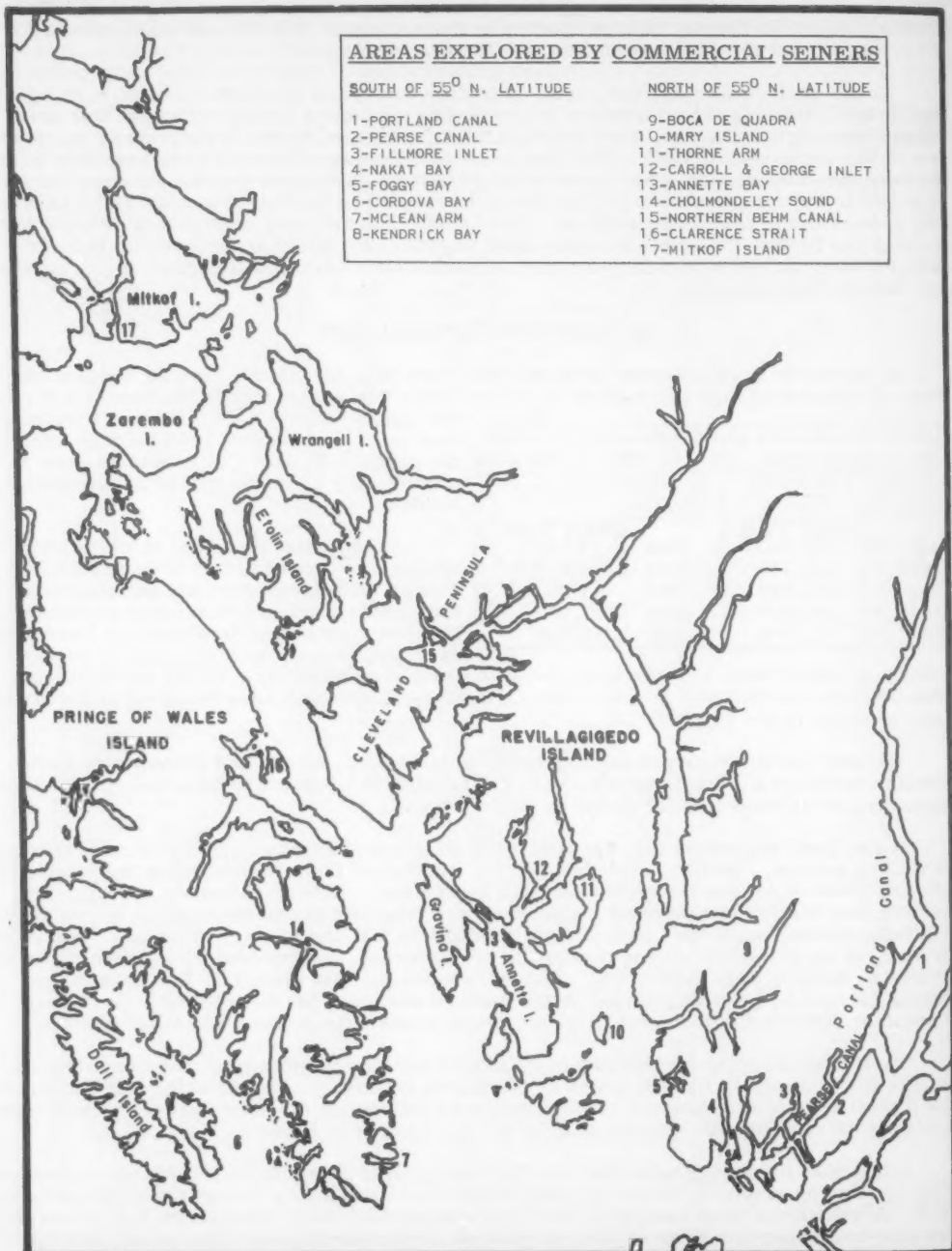


FIG. 2 - AREAS EXPLORED BY COMMERCIAL HERRING SEINERS, SOUTHEASTERN ALASKA, WINTER 1952/53.

district declined sharply in the period 1943-1948. With the discovery in the 1948/49 season of a large concentration of herring in Ogden Channel, the catch in this subdistrict has increased each year to a high of 57,300 tons in the 1951/52 season. The apparent abundance of herring in this subdistrict, which bounds on the international border, has aroused considerable speculation as to whether these stocks might not also be available to Alaskan fishermen in the Dixon Entrance area.

To determine if herring are sufficiently abundant in Southeastern Alaska during November and December to support reduction operations, the Service organized an exploratory fishing expedition in the fall of 1952. In planning these activities, it was proposed to tag herring to the extent that it would not seriously interfere with the exploratory work. The purpose was to determine if there is a southward movement of Alaska herring into British Columbia waters. It was decided to tag on the United States side of Dixon Entrance to see if any recoveries would be obtained from the British Columbia fishery during the ensuing winter period.

The exploratory expedition was sponsored jointly by the U. S. Fish and Wildlife Service and the Alaska herring industry. The Exploratory Fishing and Gear Development Section of the Service's Branch of Commercial Fisheries furnished the exploratory fishing vessel John N. Cobb. The Branch of Fishery Biology furnished biologists for tagging and the collection of biological data. The Alaska herring reduction operators furnished a purse seine and other items of fishing gear. The Alaska Department of Fisheries placed a biologist on board the John N. Cobb as an observer and to assist in tagging operations.

In the same period in which this expedition was being organized, a request was received from the industry to allow herring fishing for reduction purposes in the Dixon Entrance area. Favorable action on this request by the Service resulted in commercial fishing in waters south of 55° N. latitude during the winter of 1952/53.

The following report deals both with the explorations by the Service vessel John N. Cobb and fishing by commercial vessels since both operations furnish information on the availability of herring during the winter months.

SCOPE OF EXPLORATIONS OF THE JOHN N. COBB

The John N. Cobb operated between November 4 and December 19, 1952. The area explored extended from Dixon Entrance to Icy Strait, including Tongass Narrows, lower Clarence Strait, Sea Otter Sound, Chatham Strait, Frederick Sound, Seymour Canal, Stephens Passage, Peril Strait, and the south side of Icy Strait. (The daily log of the John N. Cobb is Appendix B.)

The gear employed was a standard Alaska herring purse seine 200 fathoms long. This seine was six strips deep, each strip consisting of 200 meshes of 1½-inch stretched measure between knots. The maximum fishable depth of this seine was approximately 10 fathoms. In addition to the purse seine, a lampara bait seine was carried. (Details of modifications of the John N. Cobb required for purse-seine operation, net construction, and operation are contained in Appendix A.)

The echo sounder used in sounding for herring was a Bendix model DR-6. This instrument gives a choice of two depth ranges: 0 to 400 feet and 0 to 400 fathoms, and makes an instantaneous and permanent graphical record of bottom depth and also of objects between the ship and the bottom. When running over fish, the depth and extent of the school are indicated by the tracing on the recording tape. Instruments of this type are now universally used by herring seiners in Alaska, and are considered essential for locating herring schools.

An experienced herring seiner captain was employed to assist in locating herring schools and to supervise actual seining operations.

SCOPE OF EXPLORATIONS BY COMMERCIAL VESSELS

On October 10, 1952, the Service amended Section 116.3 of the 1952 Alaska Fishery Regulations by extending the established closure date of October 15 to February 28 of the following year. The new closure date applied only to the waters south of 55° N. latitude. Herring fishing in Tongass Narrows for reduction purposes was prohibited. The provision which allowed for a take of 2,000 bbls.¹/ per calendar month in the remainder of Southeastern Alaska was retained.

Two companies participated in the winter fishery: the Salmon By-Products Company located at Ketchikan, and the Oceanic Fisheries Company which operated the floating reduction barge Pacific Rim at Metlakatla. Each company employed two large seiners with experienced herring fishermen and equipped with standard herring gear.

The Salmon By-Products Company was first in the field and began searching for herring with the seiners Storm and Fram on November 9. The Oceanic Fisheries Company did not begin actual fishing until December 10 with the seiners Oceanic and Vitanic. All fishing was terminated by February 11, 1953.

In the course of these operations, the vessels thoroughly scouted the waters south of 55° N. latitude and prospected to a lesser extent in areas north of that line. Inspection of logbooks kept by these vessels show that their explorations included the places indicated in figure 2.

RESULTS

OCCURRENCE OF HERRING: Except for a few localities, the findings of the John N. Cobb and the commercial vessels were largely negative. The localities in which herring were found by the John N. Cobb were Port Camden, Seymour Canal, Lisianski Inlet, Silver Bay, Kendrick Bay, George Inlet, and Tongass Narrows. Localities in which the commercial vessels succeeded in making catches were McLean Arm, Kendrick Bay, Foggy Bay, Nakat Bay, Boca de Quadra, and Northern Behm Canal (Yes Bay). Only in Silver Bay, Kendrick Bay, and Tongass Narrows were there indications of any real abundance.

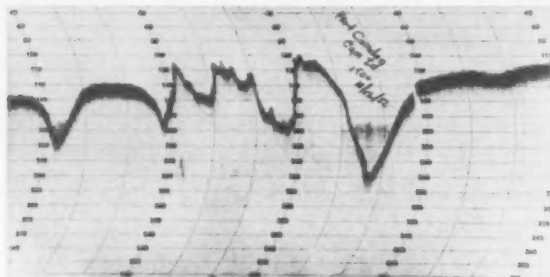


FIG. 3 - ECHO-SOUNDER TRACING OF HERRING SCHOOLS LYING IN BOTTOM DEPRESSIONS IN PORT CAMDEN, SOUTHEASTERN ALASKA, NOVEMBER 1952.

herring, as indicated by the lack of birds and by the lack of depth-sounder tracings.

Port Camden was sounded by the John N. Cobb on November 12 and 13 (see figure 3). Several schools of herring which were lying in bottom depressions were too deep for capture by purse seine. At midnight a floodlight which was played on the water attracted some of these fish to the surface and two were caught by dip net.

Seymour Canal, sounded on November 13 and 14, contained two schools near the mouth of Pleasant Bay at depths of 20 to 80 feet.

Echo-sounder tracings were recorded in Lisianski Inlet on November 20 and 21. These schools, situated between Pelican City and Soloma Point, were not in suitable position for making a purse-seine set. Several moving brown spots were also observed

¹/THE STANDARD HERRING BARREL CONTAINS 31.5 GALLONS AND HOLDS APPROXIMATELY 250 POUNDS OF FISH. EIGHT BARRELS ARE CONSIDERED EQUIVALENT TO ONE TON.

in the water and remained near the beach in a manner characteristic of small fish. Some of these fish caught by means of the "herring jig" proved to be juvenile rockfish (*Sebastes emphaeus*).

Soundings in George Inlet on December 11 showed a small school of herring at a depth of approximately 200 feet near the site of the Libby Cannery dock.

A large concentration of herring was discovered at the entrance to Silver Bay by the John N. Cobb on December 1. The magnitude of this body of fish is demonstrated by the echo-sounder tracings obtained (figure 4). At midday these schools were at depths of 220 to 260 feet. At dusk, and with the appearance of a full moon, some of these fish rushed to the surface. The subsequent flipping which appeared to extend over at least a square mile of area sounded like the fall of large hailstones on the water.

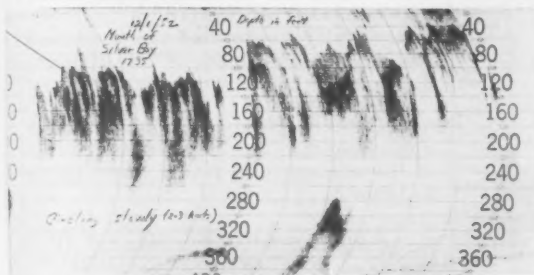


FIG. 4 - ECHO-SOUNDER TRACING OF HERRING SCHOOLS IN SILVER BAY, SOUTHEASTERN ALASKA, DECEMBER 1952.

small fish caught were obviously not representative of the main body of the school. It was anticipated that herring would be present in this area since it is the major herring spawning ground in Southeastern Alaska.

The most impressive showing of herring was in Tongass Narrows which contained an enormous body of herring throughout the winter months. It was reported by residents that the herring had first appeared in the Narrows in the latter part of October. On the John N. Cobb's first visit to this area on November 7, significant soundings were obtained at depths of 40 to 80 feet. On December 6 the John N. Cobb again sounded these waters and obtained the tracings shown in figure 5. On this date thousands of gulls and numerous sea lions were observed to be "working" on the herring schools. For about one hour following dusk the herring could be heard flipping at the surface over a wide area near the docks of Ketchikan.

The presence of large quantities of herring in Tongass Narrows is also substantiated by the echo soundings of the commercial vessels. Although these waters were closed to fishing for reduction purposes, the vessels frequently sounded them en route to and from the reduction plant. The tracings obtained were, in many instances, larger than those obtained by the John N. Cobb. All demonstrated a large mass of herring with both depth and width. The herring were mainly in the southern portion of the Narrows, extending from Potter Rock to the Ketchikan docks, a distance of approximately three miles. This concentration of herring was greater than any which the fishermen had previously observed during their experience in the summer fishery.

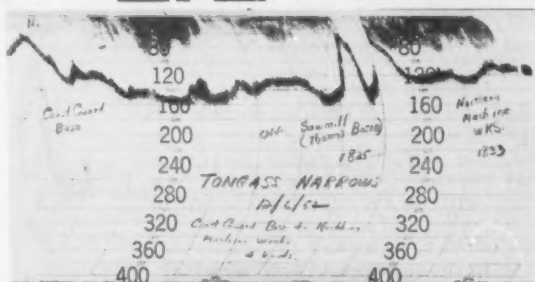


FIG. 5 - ECHO-SOUNDER TRACING OF HERRING SCHOOLS NEAR THE SURFACE IN TONGASS NARROWS, SOUTHEASTERN ALASKA, DECEMBER 1952.

Approximately 15,000 barrels of herring were removed from Tongass Narrows during the winter of 1952/53 by the bait fishery.

The occurrence of herring in Kendrick Bay and McLean Arm on the southeast shore of Prince of Wales Island was established by the catch of approximately 20,000 barrels

by the commercial vessels. The fact that they commonly loaded their holds in a single set is evidence that the herring were densely schooled. A set made by the John N. Cobb in Kendrick Bay on the night of December 8 yielded a catch of approximately 1,500 barrels.

Date	Locality					Total
	McLean Arm	Kendrick Bay	Foggy Bay	Nakat Bay	Boca de Quadra	
(In 250-pound barrels)						
Nov. 1952:						
15	500					500
22		886				886
26		1,039				1,039
Dec. 1952:						
2		1,157				1,157
5		1,026				1,026
8		1,126				1,126
10		1,034				1,034
14		798				798
15		871				871
16		1,067				1,067
17	973					973
18		2,044				2,044
19		314				314
22	510					510
23		193				193
26		1,111				1,111
27		779				779
30		1,373				1,373
31		891				891
Jan. 1953:						
3		373				373
5		1,529				1,529
6		931				931
17			1,115			1,115
20			1,109			1,109
21				1,443		1,443
22				1,061		1,061
23				2,013		2,013
24				1,089		1,089
28					1,081	1,081
Feb. 1953:						
5						831
Total	1,983	18,552	2,224	5,606	1,081	30,277

The commercial vessels also reported a fair showing of fish in Boca de Quadra. Because this locality lies north of 55° N. latitude, their catch was necessarily limited by the regulation which restricted the combined catch in waters north of this line to 2,000 barrels per calendar month.

Catches from other areas which contributed to the 30,000-barrel take of the commercial fishery are shown in table 1.

LENGTH AND WEIGHT OF HERRING: Two length measurements were taken from each fish. Body length, customarily used in measuring herring, is the distance from the tip of the snout to the end of the silvery area on the caudal peduncle after the scales have

been removed from this area. Total length is the distance from the tip of the snout to the tip of the tail. Average lengths and weights are shown in table 2.

The data from Kendrick Bay in table 2 is of special interest since this locality provided the major part of the commercial catch. These fish, which averaged only 5.8 inches in body length and 1.3 ounces in weight, were small in contrast to those caught in all of Southeastern Alaska in the summer of 1952. The summer fish averaged 8.1 inches in body length and 4.3 ounces in weight.

Catches in Foggy Bay, Nakat Bay, and Boca de Quadra were a mixture of sizes averaging much larger than the uniformly small Kendrick Bay herring. The large Nakat Bay fish, with an average body length of 8.0 inches and an average weight of 4.2 ounces, compare favorably in size to those taken in the summer fishery.

Two samples of herring were obtained from Tongass Narrows. These samples show the Tongass Narrows fish to be of mixed sizes, considerably larger than the Kendrick Bay fish, but not equal to those of Nakat Bay. Body length averaged 7.2 inches and body weight averaged 3.0 ounces.

AGE OF HERRING: The age of the herring in all samples was obtained by examination of the scales on which an annulus or winter check is formed each year. A fish with two annuli on its scale is two years old and is so designated by Roman numeral "II." Such a fish is in its third year of life and so designated by Arabic figure "3." Year class signifies the year in which the fish was spawned. Thus, for example, a fish taken in December 1952 with two annuli on its scale would be II years old, in its 3rd year of life, and of the year class of 1950.

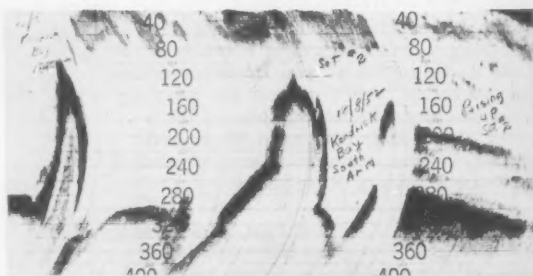


FIG. 6 - ECHO-SOUNDER TRACING OF HERRING SCHOOLS IN KENDRICK BAY, SOUTHEASTERN ALASKA, DECEMBER 1952.

The marked difference in age composition of catches from McLean Arm and Kendrick Bay in lower Clarence Strait from those of Foggy Bay, Boca de Quadra, and Nakat Bay in lower Revillagigedo Channel, is apparent in figures 7 and 8. These localities are roughly 35 miles apart. The McLean Arm and Kendrick Bay samples are comprised almost exclusively of 2-year fish from the year class of 1951. The Foggy Bay, Boca

Table 2 - Average Lengths and Weights of Herring, Southeastern Alaska, Winter 1952/53.

Locality of Catch	Date	Boat	Fish in Sample Number	Avg. Body Length Inches	Avg. Total Length Inches	Avg. Weight Ounces
Port Camden	11/12/52	Cobb 1/	2	4.65	5.49	0.74
Silver Bay	12/1/52	Cobb 2/	66	4.32	5.11	0.65
McLean Arm	12/22/52	Storm	50	5.76	6.81	1.32
	12/8/52	Fram	100	5.77	6.81	1.30
	12/9/52	Cobb	51	5.98	7.03	1.41
	12/14/52	Fram	50	5.87	6.88	1.37
Kendrick Bay	12/18/52	Fram	50	5.77	6.80	1.32
	12/23/52	Fram	50	5.71	6.76	1.29
	12/26/52	Vitanic	50	6.00	7.06	1.39
	12/30/52	Vitanic	54	5.76	6.87	1.32
	1/6/53	Oceanic	33	5.46	6.91	1.42
Weighted average				5.80	6.90	1.34
Foggy Bay	1/17/53	Fram	50	7.24	8.47	2.82
	1/20/53	Storm	50	6.91	8.18	2.52
Weighted average				7.08	8.33	2.67
Boca de Quadra	1/28/53	Storm	100	6.68	7.86	2.39
	1/21/53	Oceanic	23	8.16	9.64	4.32
Nakat Bay	1/21/53	Vitanic	15	7.35	8.71	3.20
	1/22/53	Oceanic	38	8.20	9.62	4.43
Weighted average				8.02	9.44	4.15
Tongass Narrows	12/11/52	Pirate	126	7.26	8.52	3.09
	Dec.	Cold St.	100	7.17	8.44	2.91
Weighted average				7.22	8.48	3.00
Tongass Narrows	12/15/52	Cobb 3/	50	5.37	6.37	0.90

1/CAPTURED BY DIP NET FROM FISH BROUGHT TO SURFACE BY FLOODLIGHT.

2/SAMPLE NOT REPRESENTATIVE BECAUSE SCHOOL SOUNDED AND THE ONLY FISH TAKEN WERE SMALL ONES WHICH HAD GILLED IN THE WEB.

3/CAPTURED WITH SHALLOW LAMPARA SEINE.

de Quadra, and Nakat Bay samples show a much greater spread in ages with a fair proportion of older fish. Most strongly represented in the latter samples are the 3-year fish of the year class of 1950 and the 6-year fish of the year class of 1947. The age composition of the Tongass Narrows herring is similar to that found in the lower Revillagigedo Channel district.

OIL CONTENT: The herring in each sample were segregated into age groups and each age group was ground separately. From the resulting mass a small sample was removed, and this was used for determination of the oil content of the particular age group concerned. The remaining portions of all age groups were then thoroughly mixed together. A small sample removed from this mass was used to determine the oil content of the sample as a whole. In samples consisting almost entirely of a single age, analysis was limited to this age only, under the assumption that it would adequately represent the sample as a whole. The oil content was determined by acid hydrolysis and extraction with ethyl ether and petroleum ether. The results of these determinations as expressed in percent of total weight are shown in table 4.

The recovery of 13.51 percent by weight from all samples analyzed is considerably greater than the recovery of approximately 9 percent achieved in the commercial operations. This is accounted for by the fact that separation by chemical means is more efficient than by the settling tank and centrifuge process used by the reduction plants. In

the winter fishery, the oil yield was slightly under 3 gallons per 250-pound barrel of raw fish processed as compared to an oil yield of 5 gallons per barrel normally obtained in the summer fishery.

A decrease in oil yield between the summer and winter fish was not unexpected since the fat accumulated during the summer feeding period is utilized in the develop-

Table 3--Age Composition of Herring Catches, Southeastern Alaska, Winter 1952/53

Locality of Catch	Year Class Year of Life	1952	1951	1950	1949	1948	1947	1946	1945	1944	Total
		1	2	3	4	5	6	7	8	9	
McLean Arm	Number		49	1							50
	Percent		98.0	2.0							100
Kendrick Bay	Number		429	11	1	2	1				444
	Percent		96.6	2.5	0.2	0.5	0.2				100
Foggy Bay	Number		14	64	9	3	9	1			100
	Percent		14.0	64.0	9.0	3.0	9.0	1.0			100
Boca de Quadra	Number	1	18	55	12	5	9				100
	Percent	1.0	18.0	55.0	12.0	5.0	9.0				100
Nakat Bay	Number	1	2	22	6	14	27	2		2	76
	Percent	1.3	2.7	29.0	7.9	18.4	35.5	2.6		2.6	100
Tongass Narrows	Number	3	49	74	33	47	20				226
	Percent	1.3	21.7	32.7	14.6	20.8	8.9				100

ment of sexual products during the late fall and winter. Hart, Tester, Beall, and Tully (1940) in their study of changes in the condition factor of British Columbia herring report that "a maximum oil content is reached in July and is fairly well sustained throughout the summer. In October the oil content starts to fall quite rapidly, reaching a very low value about spawning time in March." This pattern of seasonal oil change is also applicable to Southeastern Alaska herring.

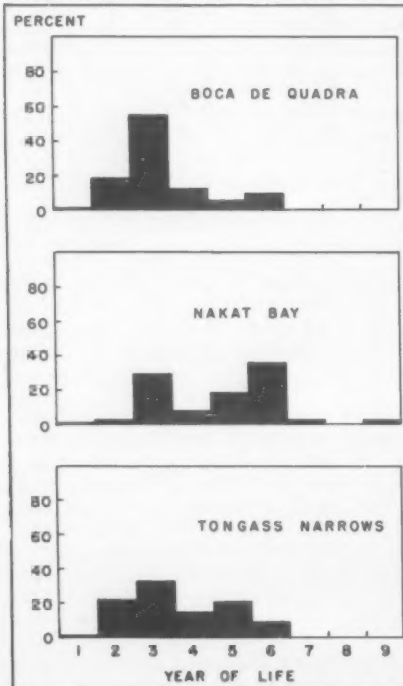


FIG. 7 - PERCENTAGE AGE COMPOSITION OF HERRING CATCHES, SOUTHEASTERN ALASKA, WINTER 1952/53.

Except for fish in their first year of life, these data show little difference in oil content with respect to age. This is somewhat surprising in view of studies 2/ made in 1942 of summer catches in the Kodiak Island district, which showed fish in their second year to be 7.7 percent, fish in their third year 16.4 percent, and fish in their fourth year 21.8 percent oil by weight. There appeared to be no significant increase in oil content beyond the fourth year. From this background a similar pattern was anticipated for the winter catches in Southeastern Alaska.

Failure to obtain such a pattern may be entirely due to the small number of samples in these determinations, or it may be possible that because the "belly fat" has been converted into milt or roe by midwinter, differences in oil content between herring of different ages is relatively slight. The high percentage of oil in the 2-year fish from Kendrick Bay might be explained by the fact that these were nearly all in their second year and sexually immature. In this group, individuals with developing gonads were extremely rare, indicating that the majority would not spawn in the following spring. Most, however, contained ester or "belly fat" in the body cavity, which was not usually present in fish which had developed spawning products.

2/UNPUBLISHED DATA OF THE U. S. FISH AND WILDLIFE SERVICE.

WEATHER AND EFFECT ON OPERATIONS: During the period of survey by the John N. Cobb (November 9 to December 16), unusually mild weather prevailed over Southeastern Alaska. Daily air temperatures recorded by the John N. Cobb ranged from

Table 4--Oil Content (Expressed as Percent of Total Weight) of Herring Taken in Southeastern Alaska, Winter 1952/53

Date	Locality	Boat	Year of Life							Composite
			1	2	3	4	5	6	7	
12/1/52	Silver Bay	Cobb	7.65	11.01	13.01					11.22
12/22/52	McLean Arm	Storm		13.65						-
12/9/52	Kendrick Bay	Cobb		13.77						-
12/18/52		Fram		13.37						13.30
12/23/52		Fram		12.41						-
12/26/52		Vitanic		13.05						-
1/17/53	Foggy Bay	Fram		10.63	12.80	13.23		11.59		14.65
1/20/53		Storm			14.59					13.03
1/28/53	Boca de Quadra	"		10.73	12.21	12.21	13.12	13.24		12.45
12/11/52	Tongass Narrows	Pirate			14.28	15.34	14.93	15.28	16.00	14.41
12/15/52		Cobb	5.11	10.42						-
Dec. ?		?			14.67	14.16	13.92	14.00		14.08
Weighted average, all samples			7.24	12.41	13.50	13.94	14.06	13.87	16.00	13.51

30° F. to 49° F., with an average of 40.5° F. Surface water temperatures ranged from 39° F. to 47° F., with the coldest waters at the heads of bays and inlets, and the warmest waters in the open coastal areas. Average surface temperature was 42.5° F. No ice was encountered at the heads of bays as would normally be expected at this time of year.

Four storms of gale force were experienced. The prevailing winds were southeasterly to southwesterly, moving warm air inward from the ocean areas. The outside waters were generally too rough for seining, which was also true of the exposed waters of Chatham Strait. It was concluded that any seining operations in that area would be subject to much loss of fishing time because of weather.

The commercial operations conducted between November 9 and February 11 included 94 days of fishing time. On 21 of these days the boats could not fish because of storms. This does not include the loss of an additional 9 days caused by a severe cold spell between January 5 and January 14 which caused the nets to freeze. Total interference to fishing operations amounted to 30 days, or approximately one-third of the total time. The cold spell caused ice to form in some of the smaller bays, including Kendrick Bay which had been the principal fishing ground up to that time.

HERRING BEHAVIOR, WINTER AND SUMMER: A noteworthy observation obtained from these experiments is the difference in behavior between the herring schools in the winter and summer seasons. In winter the herring appear to stay close to the bottom and generally at much greater depths. In this period the schools appar-

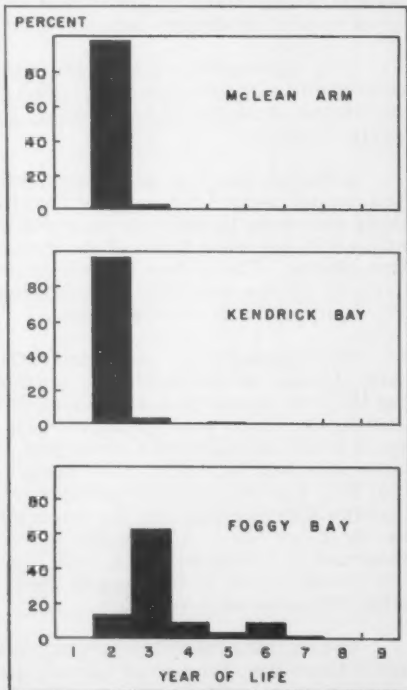


FIG. 8 - PERCENTAGE AGE COMPOSITION OF HERRING CATCHES, SOUTHEASTERN ALASKA, WINTER 1952/53.

ently congregate at certain localities where they remain until the approach of spawning in the spring. During the summer months the herring schools are constantly moving in search of food and do not appear in such dense concentrations as in the winter period.

These differences suggest that some modifications of fishing technique may be necessary for the development of successful winter operations. In this regard it is con-

Date	Locality	Series	Number
12/8/52	South Arm Kendrick Bay	USF 3-A	492
"	"	" 4-A	299
12/9/52	"	" 7-A	999
"	"	" 8-A	200
Total			1,990
12/15/52	Tongass Narrows	" 9-A	819
"	"	" 1-B	988
"	"	" 2-B	1,000
12/16/52	"	" 3-B	600
Total			3,407
Grand total			5,397

sidered significant that the nets used by the Canadians are much deeper than those which have been used in Alaska. The Alaska seines, which are six to eight strips deep, fish effectively from 60 to 90 feet. The Canadian seines, which are twelve to fourteen strips, fish effectively at depths of 120 to 150 feet.

Finding herring in the winter is dependent almost entirely on the use of echo-sounding instruments. It is only rarely that the presence of herring can be detected

by flips or feeding birds, as is frequently possible during the summer months.

TAGGING: A total of 5,397 herring were tagged, 1,990 in Kendrick Bay and 3,407 in Tongass Narrows (table 5). The international boundary line is approximately 15 miles south of Kendrick Bay and approximately 50 miles south of Tongass Narrows. In both localities the fish were caught by the John N. Cobb. A purse seine was used at Kendrick Bay and a lampara bait seine at Tongass Narrows. The catches in both localities consisted almost entirely of herring in their second year.

The tags used in this experiment were the internal metal belly tags customarily employed in tagging herring. These tags were 3/4-inch long, 5/32-inch wide, and 1/16-inch thick, rounded at both ends. Each tag bore the symbols USF, and an identifying serial number.

Although there is an appreciable tagging mortality, the internal metal tags have proven successful for tagging herring. The magnetic properties of these tags allow for their recovery by electro-magnets installed in the meal lines of the reduction plants. The plants in both southeastern Alaska and British Columbia are equipped with such magnets.

The tagging crew consisted of four men working in teams of two, one holding the fish in position and the other inserting the tag. With the fish held belly up, a small incision was made just above and anterior to the base of the ventral fin. The tag was then gently pushed through this opening into the coelomic cavity of the fish. All tagged fish were returned to the seine, from which all fish, both tagged and untagged, were later released as a school.



FIG. 9 - TAGGING HERRING, SOUTHEASTERN ALASKA, WINTER 1952/53.

The herring used for tagging were taken from the seine after the net had been dried up sufficiently to concentrate the fish. At this stage of hauling, the herring were confined in the fish bag, which rests between the vessel and the seine skiff. An outrigger pole was used to hold the seine skiff away from the side of the vessel, thereby

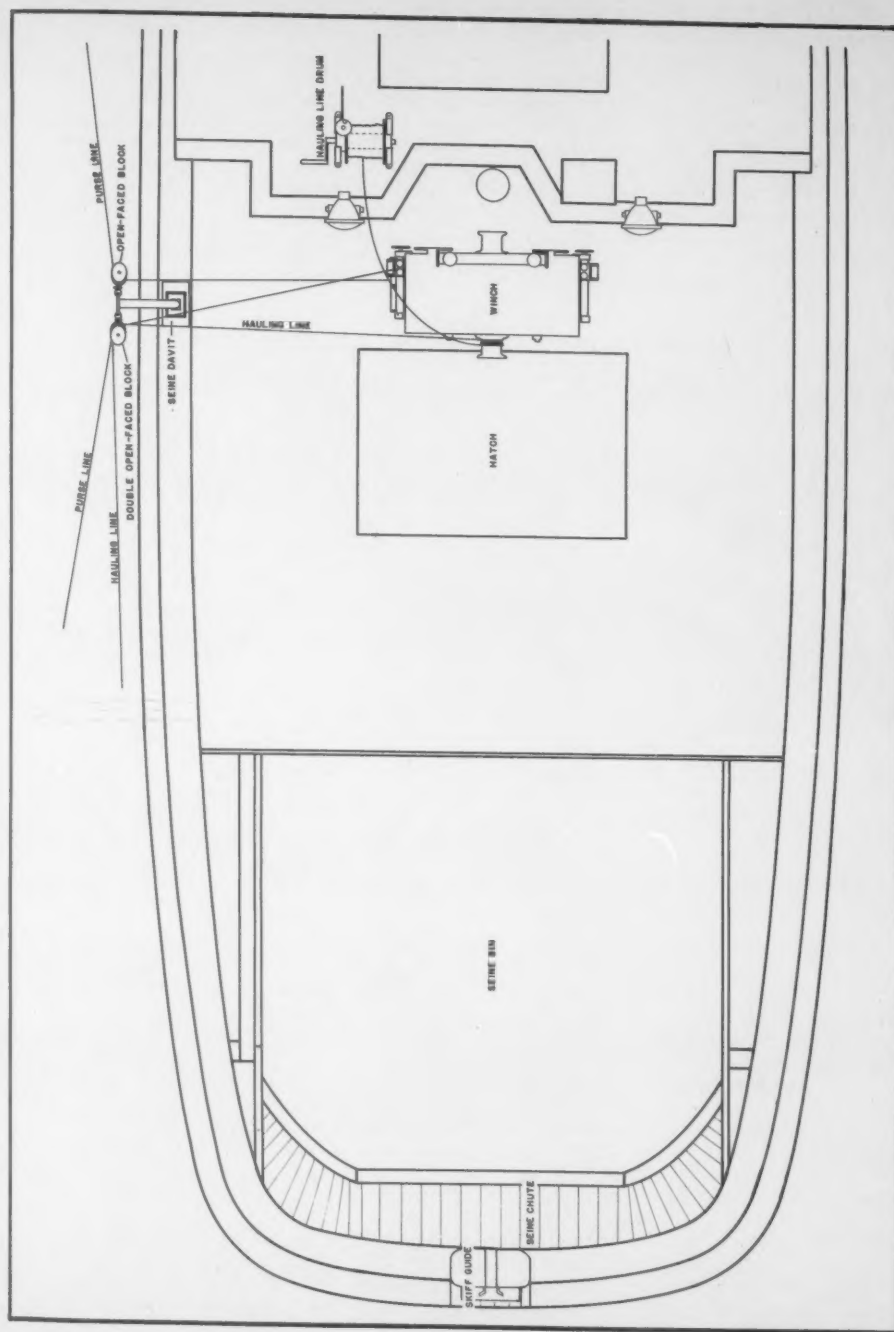


FIG. 10 - AFTERDECK OF THE JOHN N. COBB AS MODIFIED FOR PURSE-SEINING.

preventing excessive crowding of the herring within the net. The general setup of the tagging procedure is shown in figure 9.

In the 1952/53 season, a total of eight tags were recovered from the Kendrick Bay tagging. These recoveries were made by the commercial seiners fishing in this bay shortly after the tags had been affixed. Since all recoveries came from Kendrick Bay, they do not furnish any information on migration. No tags from the Tongass Narrows tagging have been recovered. The possibility for the recovery of these tags will depend on whether or not these fish move into other areas where they are subject to capture by the reduction fishery.

The British Columbia fishery did not operate in the 1952/53 season because of price disagreements, so that the possibility of Canadian recoveries was lost for the winter of 1952/53.

PROSPECTS FOR FUTURE WINTER OPERATIONS

Although the explorations by the John N. Cobb and the commercial fleet did not result in finding numerous concentrations of herring, this by no means eliminates the future possibility of winter herring fishing in Southeastern Alaska. In adjacent British Columbia waters only limited concentrations of herring have been found, but these concentrations are so dense as to support a substantial reduction fishery.



FIG. 11 - LAUNCHING SEINE SKIFF FROM THE STERN OF THE JOHN N. COBB.

exploring these waters, it might have been concluded that herring were not abundant in this area.

There appears to be a similarity between Ogden Channel and Tongass Narrows in that both are congregating areas for prespawning herring schools. Tongass Narrows, which contained an enormous quantity of herring throughout the winter, was closed by regulation to fishing for reduction purposes. Had these fish congregated in some locality open to the fishery, the success of these operations would have been assured. With this situation, the only practical limitation on the size of the take would have been the ability of the reduction plants to handle the fish.

In other areas where concentrations of herring were available to the fishery, such as in Kendrick Bay, exceptionally good catches were made. The analysis of logbooks showed the average catch was approximately 600 barrels per set, compared to an average of approximately 150 barrels in the summer period of 1952.

A factor which contributed to the low catch by the commercial vessels was the inability of one of the reduction plants to handle the fish. As a result, much fishing time was lost by the two vessels fishing for this company. The captains of these vessels declared that they could easily have doubled their catch had the plant been able to unload their fish with normal efficiency.

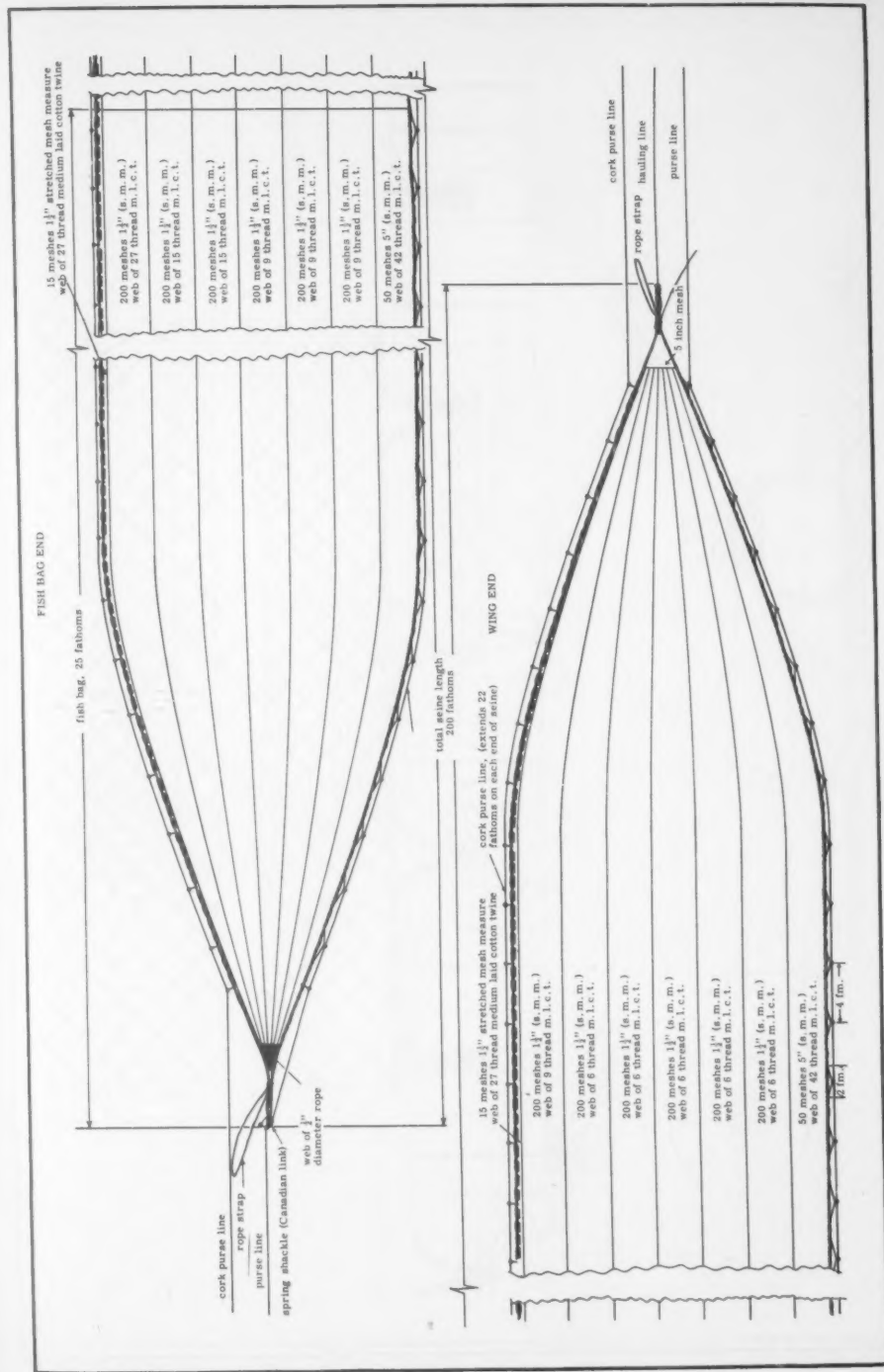


FIG. 12 - FISH BAG AND WING ENDS OF THE PURSE SEINE USED ON THE JOHN N. COBB IN HERRING EXPLORATION.

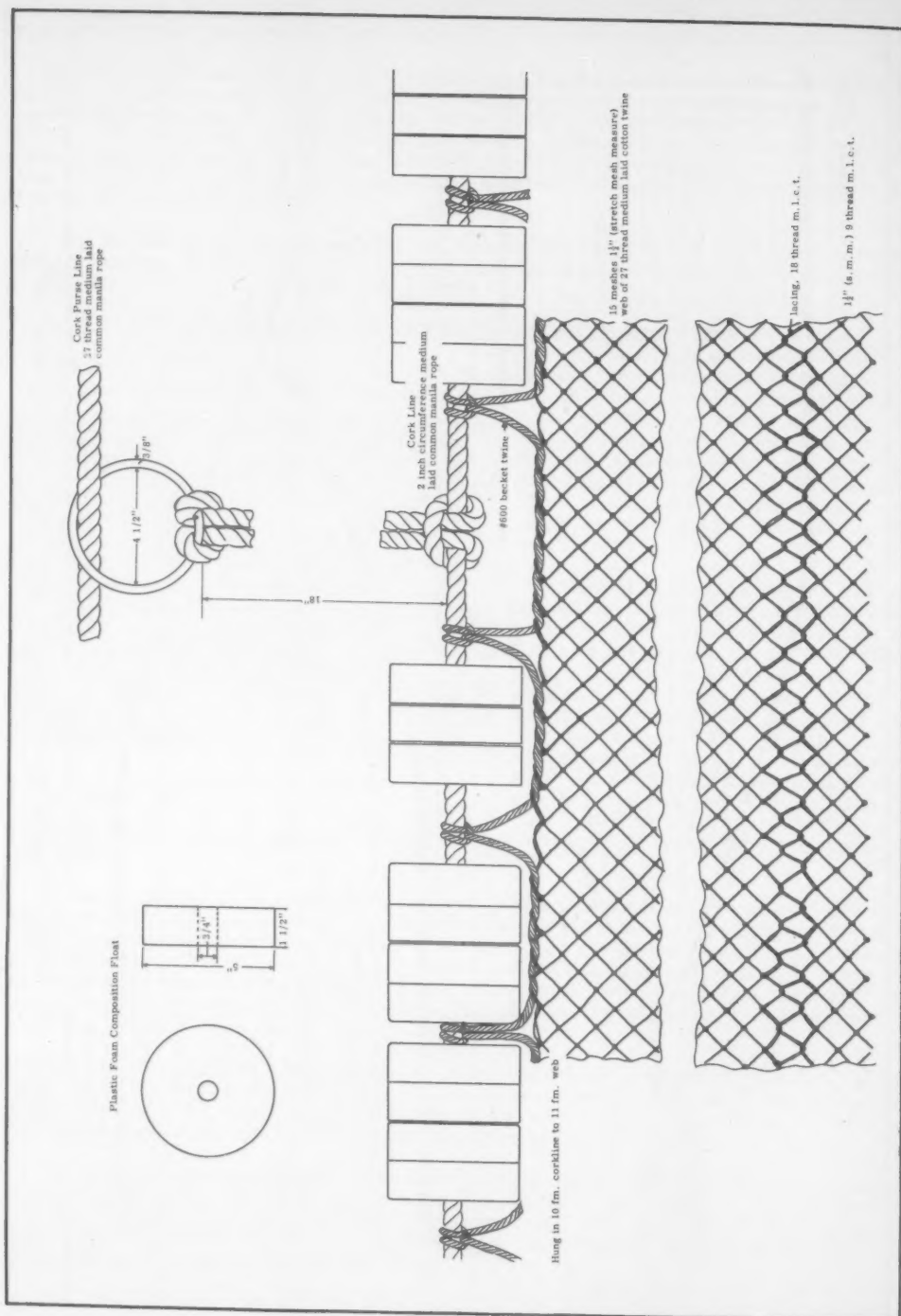


FIG. 13 - DETAIL DIAGRAM OF CORK LINE AND HANGING OF THE PURSE SEINE USED ON THE JOHN N. COBB IN HERRING EXPLORATION.

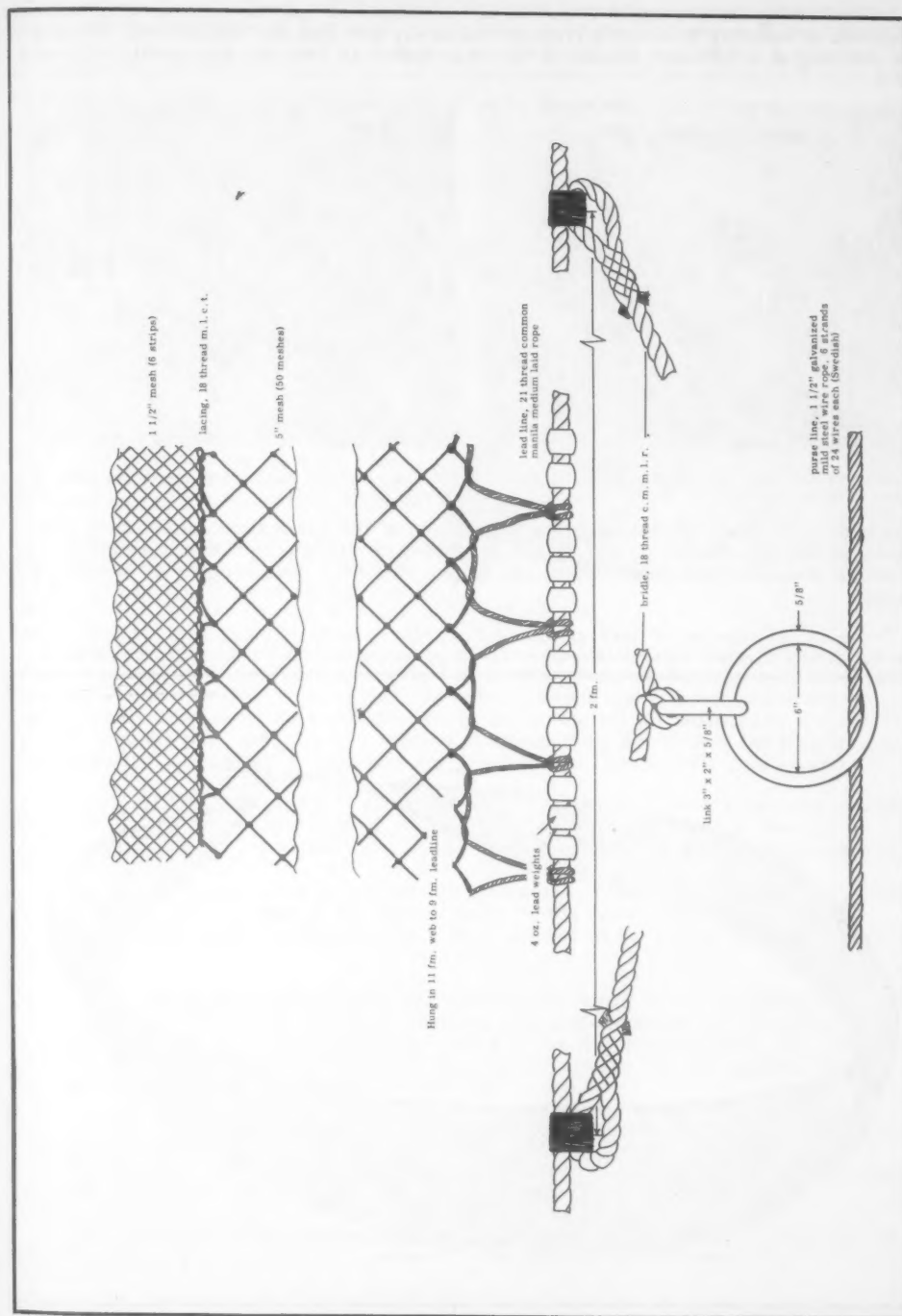


FIG. 14 - DETAIL DIAGRAM OF LEAD LINE AND HANGING OF THE PURSE SEINE USED ON THE JOHN N. COBB IN HERRING EXPLORATION.

In evaluating these results it should be remembered that the John N. Cobb was only one vessel attempting to cover a tremendous area, and that the commercial vessels were working at a different season of the year and in an area not previously exploited

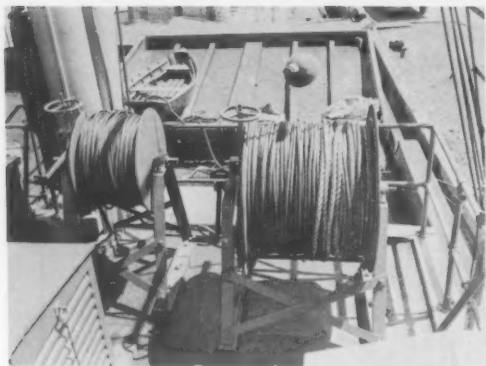


FIG. 15 - AFT HAULING- AND PURSE-LINE DRUMS OF ALASKA HERRING SEINER.

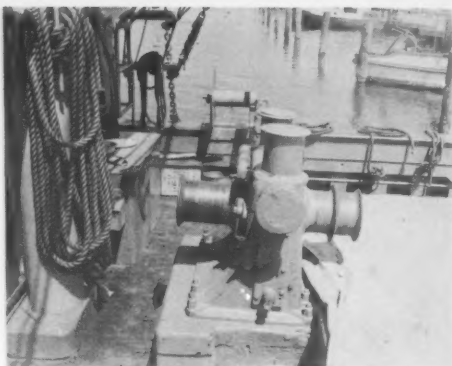


FIG. 16 - TYPICAL DECK WINCH ON ALASKA HERRING PURSE-SEINE VESSEL.

by the reduction fleet. It has been the experience of the Alaska herring fishery that success in the exploitation of new areas is seldom immediate but usually requires several years of exploration in which the fishermen learn the peculiarities of the fishing grounds.

From the standpoint of herring abundance, the results of these explorations would seem to justify further efforts in winter fishing, at least in the Dixon Entrance area.

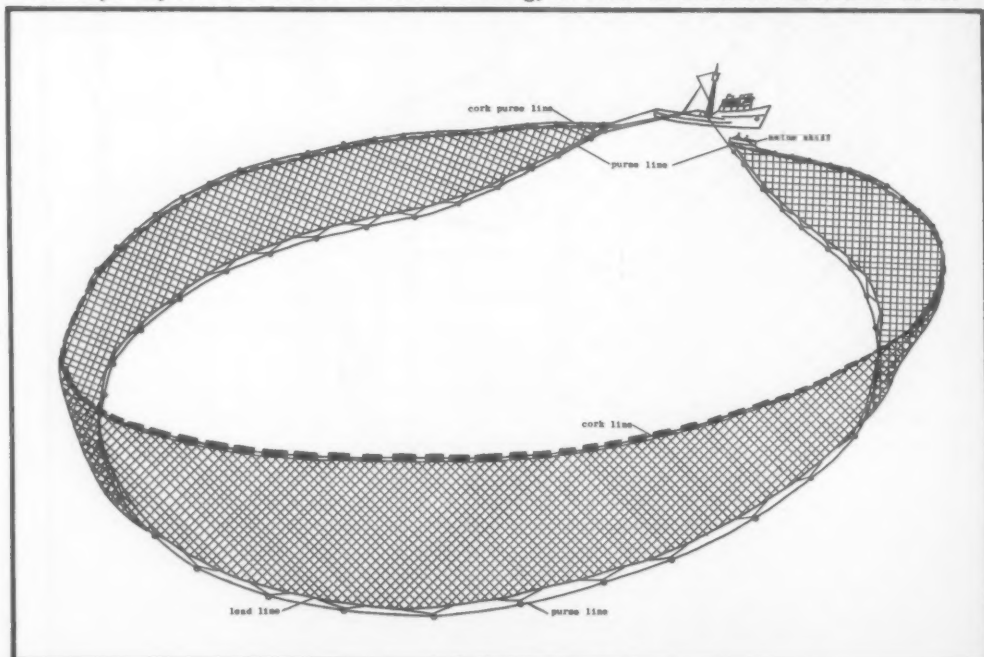


FIG. 17 - DIAGRAM OF ALASKA HERRING PURSE SEINE IN SET POSITION.

Whether or not such efforts will be made probably depends primarily on economic factors. The low oil yield of last winter, combined with the depressed state of the fish-oil market, probably resulted in financial losses for those companies concerned. It is doubtful that further commercial winter explorations can be anticipated until there is a substantial improvement in the market for fishery byproducts.

APPENDIX A - ALASKA HERRING-FISHING GEAR AND ITS OPERATION

MODIFICATIONS AND GEAR ON "JOHN N. COBB:" In order to adapt the John N. Cobb for work as a purse seiner, certain modifications were made to the afterdeck (figure 10). A net bin was constructed on the afterdeck and a seine chute was constructed across the stern to allow the seine to slide freely when making a set.

A skiff guide was built over the gunwale on the stern to facilitate launching the seine skiff.

On the starboard gunwale, a seine davit was installed opposite the winch, and a drum for the hauling line was mounted on the aft end of the deckhouse.

A standard tapered end-type Alaska herring purse seine of 200 fathoms length was used. Details of this seine are shown in figures 12, 13, and 14.



FIG. 18 - SPRING SHACKLE USED FOR ATTACHING BAG-END HAULING LINE AND PURSE LINE TO BAG END OF SEINE.

The use of rectangular-shaped nets with breastlines, described in other publications (Scofield 1951 and Murray 1952), has been discontinued by many of the Alaska herring seiners as they believe that any seine takes a tapered-end shape when being set and hauled. This taper is accomplished by gathering all the webbing to a piece of 5-inch web at the wing end and to a section of woven rope webbing at the fish-bag end. The webbing is hung to the cork line and lead line as shown in figures 13 and 14.

TYPICAL SEINING OPERATION: The foregoing describes the herring seining equipment used aboard the John N. Cobb. The gear arrangement on the typical herring seine vessel differs from that used on the John N. Cobb in the following respects:

1. The purse seine is stacked on a turntable rather than in a net bin. The turntable has a roller at the aft end to allow the net to roll freely over the stern of the vessel into the water. It is pivoted at its center and can be revolved.
2. Three drums (or reels) are used for taking in the purse lines and hauling lines. The drum for the aft hauling line and the drum for the purse line are mounted on the starboard aft corner of the deckhouse (figure 15). The drum for the forward hauling line and forward purse line is mounted on the port gunwale just opposite the winch (figure 16).
3. A winch with two gypsyheads is used for hauling the lines in. The aft gypsyhead is divided by a flange which provides two reeling surfaces. For convenience, the gypsyheads of the winch will be referred to as fore, middle, and aft (figure 16).

The operation of setting and retrieving the seine are given in the sequence of steps as follows:

1. The seine skiff is put over the stern and is towed close to the vessel by means of a painter (rope). The bag end of the seine is secured to the skiff by the

man, or sometimes two men, who operate the skiff. The skiff may or may not be powered.

2. When in suitable position in relation to the herring school, the painter is released from the deck of the vessel and a sea anchor is put out from the skiff. This slows the skiff and starts the seine off the turntable as the boat proceeds.

3. The vessel is steered in a circle around the school as the seine pays out from the turntable. The purse line comes off the outboard drum on the deckhouse, through the purse rings lined up in a trough on the port side of the turntable and into the water at the bottom of the seine.



FIG. 19 - BRAILING HERRING FROM SEINE INTO HOLD OF VESSEL.

4. As the circle is nearly completed, the wing end of the seine goes off the turntable. This is attached by a shackle and swivel to the wing-end hauling line, which pays out from the inboard drum on the deckhouse.

5. A heaving line is thrown from the skiff to the vessel and the bag-end hauling line is pulled aboard.

6. At this point the following lines are hauled in simultaneously:

- a. The forward hauling line, which is attached to the forward purse line and to the bag end of the seine by the spring shackle (figure 18) is taken in on the forward gypsyhead and wound on the drum at the port gunwale.
- b. The aft purse line is taken in on the middle gypsyhead and wound on the outboard drum on the deckhouse.
- c. The aft hauling line is taken in on the aft gypsyhead and wound on the inboard drum on the deckhouse.
- d. The bag-end cork purse line is hauled by hand in the seine skiff and coiled there.
- e. As soon as the aft hauling line is in, the wing-end cork purse line is hauled in on the aft gypsyhead and coiled on deck.
- f. Pursing continues until all the purse rings are drawn up to the seine davit. A wire rope strap is then put through them and they are hoisted up and laid on deck.

7. The position of the turntable is then reversed so that the roller faces forward preparatory to taking the seine on board.

8. Starting with the wing end the seine is hauled aboard by means of a rope strap, which is wrapped around the body of the seine. It is hoisted by a single "whip" line which runs to the tip of the boom. In successive bights, the seine is hauled out of the water and lowered on to the turntable, where it is stacked in proper order for setting again.

9. "Strapping" is continued, crowding the fish into the fish-bag end of the net. When they are sufficiently concentrated, they are dipped out of the seine with the "brail" and spilled into the hold (figure 19).

10. When the fish have been removed, the remainder of the net is strapped aboard.

11. The turntable is turned about and the bag-end purse line is rewound from the port gunwale drum to the outboard drum on the deckhouse.

12. The purse line is threaded through the purse rings and attached by the spring shackle to the bag end of the seine preparatory to making a new net.

APPENDIX B - JOHN N. COBB FISHING LOG FOR CRUISE 14 (November 4 to December 19, 1952)

November 4-7: Cleared King County Dock at Seattle, Washington, and proceeded on routine trip to Ketchikan, Alaska. Entered Tongass Narrows at 0830 and observed large flocks of sea gulls apparently feeding on herring. Fish were noted on the echo sounder between 40 and 80 feet.

November 8: Arrived at Washington Bay. Spent day unloading salt, and loading purse seine and rigging gear.

November 9: Made a practice set of the purse seine in Washington Bay. Sounded Bay of Pillars, Tebenkof Bay, and Port Conclusion with the echo sounder. The only indication of herring was one small "pip" recorded on the echo sounder in Pillar Bay and a few scattered birds in Tebenkof Bay.

November 10: Sounded Port Armstrong and Port Walter and made run toward Cape Ommaney area. The sea was too rough for making herring observations in the Cape Ommaney-Larch Bay area so the region was bypassed.

One whale was seen at the mouth of Port Walter, but no indication of herring was obtained in the Port Conclusion-Port Walter or the Cape Ommaney area. No indication of herring was seen in the Murder Cove area although a few small birds were observed.

November 11: 0700-1200 lay at Tyee due to strong southeast wind and rain. 1300-1730 scouted and sounded Security Bay, Saginaw Bay, Keku Strait, and Kake area. Several gulls were seen in Security Bay and cormorants were observed on the north side of Saginaw Bay. One small pip recorded on the echo sounder while passing the northwest tip of Keku Island. The Service's vessel Crane reported that herring flippers were seen in Big John Bay on the evening of this date.

November 12: Sounded Kake and upper Keku Strait area. Sounded Port Camden to about two-thirds the way to the head of the bay. No evidence of herring was found in the Keku Strait-Kake area but large schools were recorded by the echo sounder near the mouth of and inside Port Camden. These large schools appeared over depressions or "gullies" in the bottom. The largest of these schools

was lying over a sharp depression at depths of from 180 feet to near the bottom of the depression at 260 feet. This school was approximately 3 miles inward from the mouth of the bay. Numerous small pips were recorded from near the surface to the bottom in the outer one-half of the bay. Small herring were brought to the surface near midnight on November 12 by playing the searchlight and a submarine light on the water. Several herring taken in dip nets proved to be one- and two-year-old fish.

November 13: Continued sounding in Port Camden and Keku Strait areas. Herring in Port Camden appeared deeper and even more densely packed over depressions in the bottom than on November 12. Left area at 1225 for Seymour Canal. Echo sounder recorded several small pips of feed between Port McCartney and Turnabout Island. Entered Seymour Canal at 1525; evidence of small amounts of feed showed on echo sounder at 60- to 80-foot depths, numerous sea gulls, several whales, and one hair seal were seen near the entrance to Mole Harbor in Seymour Canal. Anchored for night in Mole Harbor. Night observations revealed no herring.

November 14: Sounded Seymour Canal from Mole Harbor to Windfall Harbor including area around Dorn Island and Tiedeman Island. A scattering of small traces were recorded in Mole Harbor from the surface to 80 feet. A murre was seen with a fish of about 2 inches in length, and one small fish (presumably herring) was seen flipping. Scattered birds were seen working the entire bay. In the vicinity of Tiedeman Island and Windfall Harbor, many small birds and numerous whales were seen but no evidence of herring, other than small pips at various depths on the echo-sounder tape. Launched seine skiff and prepared for possible night set at 1500. At 1735, in the mouth of Pleasant Bay, a large dark trace appeared on the sounder tape at 40- to 80-foot depths. This area was drifted, sounding until 1945. The sounder showed numerous small pips which seemed to be fish rising toward the surface. Another fairly good-sized school was recorded at 1815 in the stratum 20 to 76 feet.

November 15: Left Seymour Canal. Sounded area on west side of The Brothers Islands, the

right arm of Pybus Bay, and the right arm of Gambier Bay. A few small pips were recorded near The Brothers Islands and in the right arm of Gambier Bay. Otherwise no sign of herring was seen in this area.

November 16: Left Gambier Bay for Petersburg. Small pips of feed were encountered in the vicinity of Sukoi Island. Fair to good showings of feed were recorded at the north entrance to Wrangell Narrows. Arrived at Petersburg at 1625.

November 17: Left Petersburg at 0900 for Windham Bay. A light and narrow band was recorded on the echo sounder at 180 feet just inside of Sunset Island near Windham Bay. Soundings in Windham Bay showed no evidence of herring. Upon rechecking the Sunset Island area the light narrow tracing was again picked up. This tracing continued for 10 miles as the vessel proceeded up Stephens Passage, rising gradually as darkness fell until it ended at 1630 off Point Astley. A herring jig was tried at the depth of this recording with no results. Anchored at 2005 in southeastern end of Gilbert Bay.

November 18: Sounded in Gilbert Bay and Port Snettisham and then proceeded to Juneau. Some very small pips were recorded at about 30 feet near Whiting River in Gilbert Bay. No other indications were seen in upper Stephens Passage or Port Snettisham. Arrived at Juneau at 1248.

November 19: Left Juneau at 0900. Sounded Gastineau Channel and westward in Stephens Passage to Barlow Cove. A scattering of small pips was recorded off the SE. tip of Douglas Island (Point Hilda) from 20 feet to the bottom at 240 feet. Several gulls were observed upon entering Barlow Cove at 1345. The cove was sounded until 1730, but only a few scattered small pips were recorded.

November 20: Raised anchor in Barlow Cove and sounded out of cove heading for Lisianski Inlet. At 1145 observed five small pips at 20 fathoms between Porpoise Islands and Hoonah in Icy Strait. Sounded between Eagle Point and Point Adolphus, recording only a few small pips from the surface to the 120-foot depth. Ran SE. in Lisianski Inlet to Pelican City. A group of sea gulls and a sea lion were observed at the junction of Lisianski Strait and Inlet but no tracings were recorded on the echo sounder. A large flock of sea gulls sitting on the water near Pelican City was investigated but no pips were recorded on the sounder.

November 21: Left Pelican City, sounding toward the head of the inlet. Found one school of herring at $1\frac{1}{2}$ miles north of Soloma Point. Made preparation for a set. Sounded to the head of the inlet with negative results. Herring were found again in the vicinity of Soloma Point in two schools estimated by Fishing Captain Hansen to be about 200 barrels each. Two herring were caught on the jig gear. These schools were too close to the beach to make a purse-seine set on them. Near Miner Island several large brown spots indicating schools of fish were observed. Large flocks of gulls were seen working here and several were seen catching fish. Upon sounding over these schools, large light tracings were recorded from the surface to the 80-foot depth. This area was fished with the herring jig and approximately 10 young rockfish about 3 to 4 inches in length were caught. These fish were staying close to the creek mouth.

November 22: Sounded from Lisianski Inlet to Idaho Inlet finding no evidence of herring on the echo sounder. At 1245 a large group of gulls was investigated in Idaho Inlet. A fairly large group of small pips was recorded at 20 feet to 40 feet, but the jig gear failed to catch any herring. Continued sounding and investigating bird groups in Idaho Inlet until 1554. No evidence of commercial quantities of herring was found here.

November 23: Left Hoonah at 0930 and sounded Port Frederick, finding a few scattered pips of feed distributed from the surface to the 400-foot depth, but otherwise no sign of herring. Left Port Frederick for Freshwater Bay at 1300. Entered Freshwater Bay at 1710 and sounded in the vicinity of Wachusett Cove and Pavlof Harbor finding no indications of birds or herring.

November 24: 0800. Started sounding out of Freshwater Bay to Tenakee Inlet; no sign of herring. Sounded in area off the Superior Packing Co. cannery, finding no indication of feed and no birds. At 1030 the Bendix echo sounder stopped operating due to a burned out motor; Juneau was contacted by radio for parts and sounding was continued with the Submarine Signal Co. flasher-type echo sounder. Tenakee Inlet was investigated to a point approximately 7 miles from the head of the inlet. At 1635 a small flock of gulls and murrees was seen working in the tide rip 3 miles west of Long Bay area, Tenakee Inlet. Anchored near Long Bay at 1930. The searchlight was played upon the water at night but failed to raise any herring.

November 25: Continued observations in Tenakee Inlet until 1135 with negative results and then left for Hawk Inlet. Investigated Hawk Inlet from 1335 to 1535 finding several hair seals, and large flocks of scoters, ducks, and gulls in the vicinity of the river flats, but no other indications of herring either on the surface or on the echo sounder. Proceeded toward Juneau to repair echo sounder. Anchored in Barlow Cove at 1850.

November 26: Sounded from Barlow Cove to Juneau, finding no indications of herring schools. Several whales were noticed in the vicinity of Point Tantalum.

November 27, 28, and 29: Waited for parts to repair echo sounder at Juneau.

November 30: While running, sounded Peril Strait, Salisbury Sound, and Neva Strait, anchoring in Nakwasina Passage at 1640.

December 1: Sounded Katlian Bay. Two small tracings were recorded at a depth of 220 feet and small fish were seen surfacing among the rocks and small islands in the north end of the bay. Sounded past Sitka to Silver Bay entering the bay at 1150. Many sealions and a whale were observed at the mouth of the bay. Large schools of herring were recorded lying on the bottom at the 220-foot depth at the entrance to the bay.

Tied up at Sitka at 1328 and returned to Silver Bay at 1700. A large body of fish was picked up again at the entrance to the bay. This school was about two-thirds of a mile long by one-third of a mile wide, lying deep, mostly just off the bottom at the 250-foot depth. At about 1900, good-size herring were heard flipping all about the boat, but

the echo sounder showed the main body of fish to be lying near the bottom. Fishing Captain Hansen said he had never heard so many flippers nor seen such a compact concentration of herring in any area. A purse-seine set was made at 1955, but the school was missed and only a few small herring were caught. The school was either too deep or sounded as the set was made. Net back aboard at 2145.

December 2: Left Sitka, running southeasterly down outside coast of Baranof Island. Sounded Larch Bay from 1600 to 1625 finding no indications of herring on the echo sounder. The sea was too rough to work the area well. Anchored in Port Armstrong at 1800.

December 3: Remained in Port Armstrong due to storm warnings and winds to gale force in Chatham Strait.

December 4: Left Port Armstrong for the Warren Island area. Sounded the Warren Channel, Bocas de Finas, Gulf of Esquibel, and Arriage Passage area including Steamboat Bay and the east side of St. Joseph Island. These areas were devoid of signs of herring except for a few scattered birds and three whales seen in the vicinity of Noyes Island.

December 5: Investigated Davidson Inlet and Token Bay with negative results. Only a very few scattered gulls were seen. Cleared Davidson for Ketchikan with sounder operating.

December 6: Proceeded to Wards Cove in Tongass Narrows to observe herring reduction there. Sounded Narrows en route to and from Wards Cove, finding no schools of herring. Sounded Tongass Narrows near Ketchikan from 1610 to 1850. Large schools were recorded, apparently beginning to rise from the bottom at about 1700. At 1742 to 1752 a nearly solid school of herring was found extending from the Coast Guard Base to the Northern Machine Works, a distance of $1\frac{1}{2}$ miles on the Ketchikan waterfront. This school extended from the 20- to about the 80-foot depth.

December 7: Left Ketchikan for Kendrick Bay. Sounded south arm and short arm of Kendrick Bay and McLean Arm. Many birds, sea lions, and a few hair seals were seen in Kendrick Bay, and schools of fish were recorded near the bottom in both Kendrick Bay and McLean Arm. At 2100 the sounder showed a school of fish at the 20- to 40-foot depth in McLean Arm. These were apparently

rising. Some of these fish were drawn up to light and were seen to be small.

December 8: Sounded again in McLean Arm and Kendrick Bay. Fish were recorded by the sounder in both places near the bottom. Anchored in Kendrick Bay at 1030 to await darkness and the rising of the herring. Started sounding again at 1700 and set on large school 20 to 80 feet deep. Pursued seine, catching approximately 1500 barrels of small herring.

December 9: Spent day tagging herring and overhauling gear.

December 10: Left Kendrick Bay for Carroll Inlet. Sounded Carroll Inlet to head, finding only a few small pips on meter at the entrance and several sea gulls and murrens near Gnat Cove. Anchored near Spit Cove at 1512. Raised anchor at 1845 and sounded toward mouth of the inlet.

December 11: Sounded out of Carroll Inlet and found no more indication of herring. Sounded George Inlet to vicinity of Libby's cannery. In this area several small pips near the surface and large dark tracings of schools of herring on the bottom at 200 feet were recorded. Left area for Ketchikan at 1000. Tied up at Ketchikan for mail and motorboat repairs. Left for Washington Bay at 1610.

December 12: Arrived at Washington Bay and spent day repairing and salting down purse seine.

December 13: Finished repairing and storing net.

December 14: Left Washington Bay for Ketchikan.

December 15: 0455. Arrived at Ketchikan and tied up at Tongass Trading dock. The echo sounder and flippers indicated herring just off the dock. A set was made on these with the lampara net and seine skiff to catch herring for tagging. Spent the day tagging herring.

December 16: Tagged herring from 0830 to 1100 and then left for Metlakatla to consult with personnel of Oceanic Fisheries Co. on their reduction barge there.

December 16-19: Routine run to Seattle, arriving at Fish and Wildlife Service's dock at 1500, December 19.

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SMALL FRY ARE IMPORTANT

Today's children are tomorrow's customers. If they are trained to like fish and shellfish when they are young, it is likely that they will acquire a fondness for products-of-the-sea that will carry on when they later become heads of families. This fact was well confirmed in tests of the eating habits of men in the Armed Forces during World War II.



SCHOOLS ARE A MARKET FOR FISH.

Until a few years ago there was a widespread feeling that children did not like fish and would not eat it at school. Actual tests in schools however, have proven that if fish (or shellfish) is prepared properly and served attractively, school children will not only eat it but will acquire a liking for it.

Fish-cookery demonstrations by home economists of the Educational and Market Development Section of the U. S. Fish and Wildlife Service for school lunchroom supervisors, managers, and cooks constitute a substantial part of the educational program to get the children to eat and like fishery products. In every one of the 26 states where this program has been given so far, fishery products are now served more often and enjoyed by more children. As a result of this the schools are buying more fish.

The fish-cookery demonstration program of the Service is conducted in co-operation with the different state departments of education. To date, 21 of the 26 states east of the Mississippi River have had statewide programs for their school lunchroom personnel. Louisiana and Minnesota have also been covered. In several of the Plains States and in the three Pacific Coast States, the Service has presented several demonstrations but not on an extensive basis. This school year the program is being conducted in Iowa, Wisconsin, Michigan, Oklahoma, Pennsylvania, and West Virginia.



Progress on Projects, October 1953

FREEZING FISH AT SEA--NEW ENGLAND: The research trawler Delaware completed test cruise 24 on September 30. The purpose of the cruise was to test the refrigeration equipment and the improved brine-freezer mechanism under full-load conditions during round-the-clock fishing operations with a full crew. Fishing was carried out on Western Bank in the area of Sable Island, about 450 miles east of Boston. The vessel was at sea for 12 days, of which 8 were spent in actual fishing operations. Approximately 99,000 pounds of fish (41,000 pounds of haddock; 32,000 pounds of scrod haddock; 22,000 pounds of cod; and 4,000 pounds of miscellaneous species) were brine frozen in the round at sea and stored in the vessel's hold at about +5° F. The entire catch was sold through the New England fish exchange to firms which would use the frozen whole fish for later processing into frozen fish fillets.

The modified brine freezer gave excellent performance during the entire fishing and freezing-at-sea operation.

Data were collected on the performance of the refrigeration equipment under full-scale continuous operating conditions at sea and the costs of this type of operation were recorded for comparison with those involved for the standard iced-fish technique.

Efforts were made to improve dockside unloading of the frozen fish from the Delaware. The unloading of the 99,000 pounds of frozen fish required 11 hours. Several delays occurred which might be eliminated in the future when auctioneers, buyers, and handlers are better acquainted with the operations involved in the handling of frozen whole fish. The fish were loaded into wooden boxes, placed on pallets, then hauled by truck to the cold-storage room.

(Boston)

VITAMIN CONTENT AND NUTRITIVE VALUE OF FISHERY BYPRODUCTS: Niacin assays were completed on 23 samples of menhaden meal and one sample of crab meal. The menhaden meals represent samples of carload lots. The results were as follows:

Meal	Number of Samples	Niacin content in micrograms per gram of meal as received		
		Minimum	Maximum	Average
Menhaden	23	34	74	54

The crab meal sample as received showed a niacin content of 33 micrograms per gram.



(Seattle)



TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

A total of 56 vessels of 5 net tons and over received their first documents as fishing craft during August 1953--15 more than in August 1952. Florida west coast led with 11 vessels, followed by Virginia with 8 vessels, and Washington with 7 vessels, the Bureau of Customs reports.

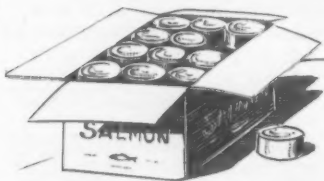
Vessels Obtaining Their First Documents as Fishing Craft, August 1953 and Comparative Data					
Section	August		Eight months ending with August		Total 1952
	1953	1952	1953	1952	
	Number	Number	Number	Number	Number
New England	-	3	16	23	30
Middle Atlantic	2	1	15	22	26
Chesapeake	11	3	53	43	65
South Atlantic	7	6	69	57	89
Gulf	20	15	156	88	161
Pacific	9	9	139	187	203
Great Lakes	-	-	5	7	13
Alaska	6	4	43	80	88
Hawaii	1	-	2	-	-
Total	56	41	498	507	675

NOTE: VESSELS HAVE BEEN ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORT.



Alaska

CANNED SALMON PACK, 1953: The Alaska canned salmon pack declined this year from 3,574,000 cases in 1952 to a total of 2,792,547 in 1953, the U. S. Fish and Wildlife Service reported to the Secretary of the Interior on October 1. The catch in 1951 was 3,484,000 cases. Despite the over-all poor season, the yield of red salmon in southeastern Alaska was 75 percent greater than in recent years.



Final pack figures for 1953 will be increased by the returns from Alaska's fall fishing season which started late in September. The fall catch will be a good one, according to early indications.

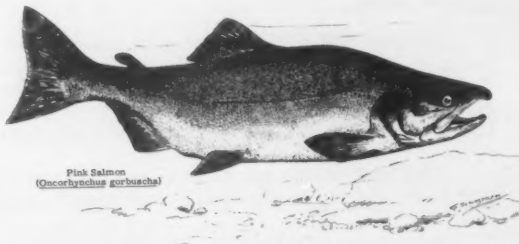
The decline in 1953 was due primarily to the failure of the pink salmon runs in southeastern Alaska and the below-average red salmon runs in parts of the Bristol Bay area of western Alaska. Offsetting the relatively poor pink and chum runs in southeastern Alaska was the good run of red salmon in this area which yielded a 75 percent greater pack than in recent years. The earnings of gill-net fishermen in the Lynn Canal, Taku, and Stikine sections were materially enhanced as a result.

Although the central Alaska pack was 5 percent smaller than last year, it showed an increase of 25 percent over 1951. The 5-percent decline this year was due chiefly to an average pack of red salmon in the Copper River area as compared with an abnormally large output last year. Although production in the Prince William Sound area was about 15 percent lower than last year, it increased 30 percent over 1951. In Cook Inlet 1953 production was down about 25 percent, but was normal for the odd year (when pink salmon runs are small). In the Kodiak area this year's pack was roughly 15 percent lower than last year, but 40 percent higher than 1951. In the Chignik area production was about 30 percent above 1952 and 90 percent above 1951. The 1953 Alaska Peninsula pack exceeded that of other recent years--67 percent higher than the average for 1952, 1951, and 1950.

In western Alaska the 1953 salmon production in the Bristol Bay area was about 30 percent under 1952, but 45 percent above 1951. Frozen salmon equivalent to an estimated 100,000 cases were shipped to the United States for canning from the Bristol Bay and Kodiak area. Good runs and catches were reported for two of the four districts of Bristol Bay, Ugashik, and Egegik, but were far below normal in the other two. In Nushagak comparatively few fishermen operated, however, and individual catches were relatively good in spite of expected small runs.

Approximately 11,000 commercial fishermen operated in Alaska in 1953 as compared with about 7,000 in 1946.

CAUSES OF FAILURE OF PINK SALMON RUNS: Failure of pink salmon runs in Southeastern Alaska this season, which is bad news to the industry, occurred after the fry had left fresh water, the Service's Branch of Fishery Biology reports. This year was the good year of the cycle. The 1951 escapement appeared adequate, and egg-and-fry-survival conditions were excellent. The fresh-water survival index, which was established several years ago and is valuable in measuring early mortality extent, gave values of 17.6 for the 1949 brood and 49.5 for the 1951 brood; these values surpassed the average fresh-water survival. As small migrants left their streams in the spring of 1952, their abundance was obvious.



Pink salmon runs are noted for their extreme and erratic variability in returns. Past studies have shown that conditions affecting fresh-water survival have caused much of this variability. Winter temperatures, stream flow, and precipitation are important to egg and fry development.

As part of ocean survival studies, young fry have been marked and released as they were leaving fresh water. Through use of mark returns in Herman Creek in 1952, an off-year, ocean survival was estimated at .08 percent, while in 1953 it dropped to .009 percent, which is about 1/10th the 1952 survival rate.

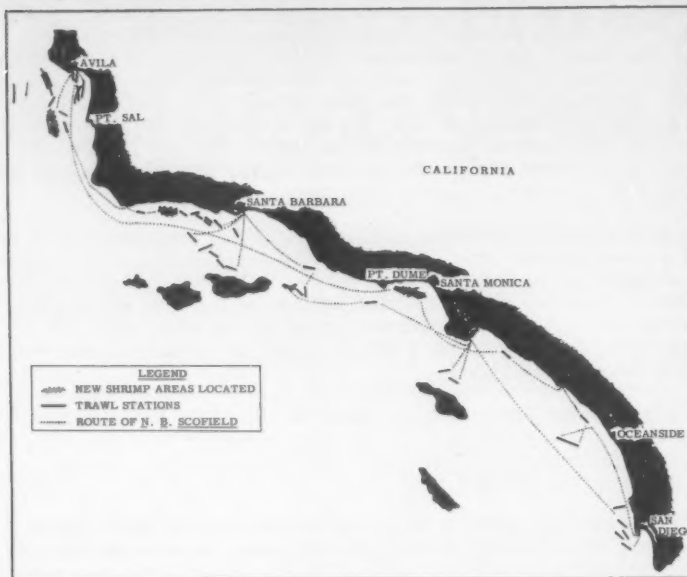


California

MID-WATER TRAWL TESTED AND NEW SHRIMP BED FOUND BY "N. B. SCOFIELD"
(Cruise 53-S-3): A new commercially-important shrimp bed was discovered off the southern California coast by the California Department of Fish and Game's research

vessel N. B. Scofield on a 22-day cruise, reports a July 2 release from that agency. On the same cruise, a new mid-water trawl using a single boat was tested. The cruise

was made to the continental shelf area from Avila, California, to San Diego, California, and was completed at Los Angeles on June 25.



ROUTE OF N. B. SCOFIELD ON CRUISE 53-S-3. LOCATION OF NEW SHRIMP AREAS SHOWN.

The first portion of the trawl trip was devoted to adjusting the rigging on the new commercial size mid-water trawl for proper operation. The mid-water trawl has a mouth opening of 35 square feet, and has small wings at each of the four corners. The net is 100 feet in length and is constructed of 21-thread, $4\frac{1}{2}$ -inch mesh. The opening of the net mouth is maintained while towing at high speeds (7 knots) by using commercial otter doors to spread the net, in conjunction with four small paravane doors attached to the short wings of the net.

Shrimp and bottom fish exploratory work was then undertaken with the 10-foot beam trawl off Pt. Huneme and west of Santa Barbara. Small catches of prawn (*Pandalus platyceros*) were recorded. A sizable catch of shrimp (*Pandalus jordani*) was taken off Gaviota. Fishing activity was then shifted to the Avila region where an extension of the present commercial shrimp bed was found 12 miles west of Pt. Sal in 90-100 fathoms.

The mid-water trawl was used off Avila, and small catches of rockfish and blackcod were made before the net became fouled and torn on an uncharted reef.

Rough seas prevented any other trawling in deep water, so fishing activity was moved to the Santa Barbara Channel. Several exploratory shrimp deep-water stations were occupied in this area.

Seas calmed north of Pt. Conception and two sets were made with commercial-size otter-trawling gear. About 300 pounds of large dover sole were taken in the first set. Weather again stopped further deep-water work. The boat sailed south to explore for shrimp off Southern California. The 90-100 fathom curve between Pt. Dume and Santa Monica submarine canyon was explored and a new shrimp bed found. One 55-minute test drag with a 10-foot beam trawl resulted in a catch of 123 pounds of large shrimp. The 90-100 fathom curve was explored from Diana Pt. to San Diego and found that most areas were too rough to trawl. Trawling was done off Oceanside and San Diego with little success.

"N. B. SCOFIELD" TAGS MORE ALBACORE (Cruise 53-S-4): A total of 754 albacore were tagged by the California Department of Fish and Game's research vessel N. B. Scofield on a 21-day cruise off southern California and Baja California, a September 11 release from that Agency states. The cruise was completed at Los Angeles on August 26. Other tuna tagged on the trip were 3 yellowfin, 4 skip-

jack, and 3 bluefin. A total of 74 yellowtail were also tagged. Experimental type "F" and "G" tags were used and flowing salt water was tried as a possible means of keeping the fish quiet while being tagged.

Good fishing was found 100 miles southwest of Guadalupe Island, and most of the fish were tagged in that area. In general, moderate to strong northwest winds prevailed throughout the duration of the cruise and some fishing time was lost through bad weather. The bluefin tuna, yellowfin tuna, and yellowtail were tagged while the vessel was stormbound in the lee of Guadalupe Island. The skipjack tuna tagged were found mixed with the albacore schools.

No difference was observed in the behavior of albacore held in the tagging cradle with a stream of water directed at the head, than without. As before, the best way for handling the fish was to place a hand over the eyes within a few seconds after the fish was brought aboard, and to complete the tagging operation within 20 to 30 seconds after being brought aboard. It was found, as is the case with skipjack, that once an albacore began a flurry of vibration, such a flurry always terminated in severe gill hemorrhage. Therefore, any fish which began to vibrate was discarded.

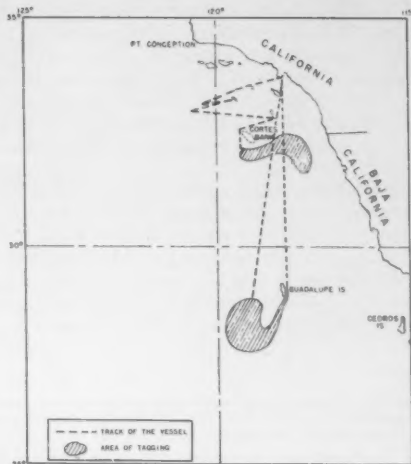


The fish taken southwest of Guadalupe Island were found to be in blue water with a surface temperature of 66° F. A few smaller fish were taken in water with a surface temperature of 64° F. south of Cortez Bank and San Clemente Island.

SARDINE ABUNDANCE SURVEY BY "YELLOWFIN" (Cruise 53-Y-7): A census of the abundance of sardines resulting from the 1953 spawning, and the abundance of adult sardines, jack mackerel, Pacific mackerel and anchovies was the objective of the California Department of Fish and Game's research vessel Yellowfin on a 22-day cruise off the lower California coast. The cruise was completed at Los Angeles on August 20 and included the area from Santa Maria Bay to Sebastian Vizcaino Bay, including the area around Guadalupe Island, according to a September 3 release from that Agency.

A total of 331 miles was covered while scouting for fish. A total of 181 schools of fish were observed. It was estimated that 63 of these contained sardines, 17 anchovies, 36 Pacific mackerel, and 34 jack mackerel. Sixty-five light stations were occupied yielding five samples of 0-year class sardines, 15 samples of adult sardines, 9 of Pacific mackerel, and 14 of jack mackerel.

An average of one school of fish was observed for every 2.2 miles scouted. Only 7.7 percent of the light stations yielded 0-year class sardines. In 1952 in this same area one school of fish was observed for every 1.9 miles scouted and 40 percent of the light stations yielded 0-year class sardines.



AREAS WHERE ALBACORE TUNA WERE TAGGED BY
N. B. SCOFIELD.

Many of the albacore tagged in the fishing southwest of Guadalupe Island were very large--over 40 pounds. Examination of the reproductive organs revealed that these fish had spawned recently. Several of the yellowtail tagged at Guadalupe Island were running ripe with sexual products.

Chesapeake Bay States Form Fin-Fish Conservation Commission

An organizational meeting of the joint Commission on Conservation of Migratory Fin-Fish marked the initiation of an important step in cooperative conservation effort between the states of North Carolina, Virginia, and Maryland, reports the August 1953 Maryland Tidewater News, a Maryland Department of Research and Education publication. Legislative committees and scientists from the three states met at Old Point Comfort, Va., on July 16 to discuss the development of a program directed toward restoration and management of the several jointly-exploited migratory species.

A chairman and two vice-chairmen were elected for the commission, a chairman representing each of the three states. A resolution was passed requesting the research agencies of the states, in cooperation with the U. S. Fish and Wildlife Service and other research groups, to draft a cooperative research program to determine the cause of decreases in quality and quantity of food fish in the tri-state area. In the week following the meeting fishery biologists of the three states conferred at Morehead City, N.C., and prepared a program for presentation at the next commission meeting held in North Carolina on August 24.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISH PURCHASES BY DEPARTMENT OF THE ARMY, AUGUST 1953: A total of 3,048,474 pounds (valued at \$1,425,408) of fresh and frozen fishery products were purchased for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps in August 1953 (see table). This was an increase of 23.6 percent in quantity and 69.9 percent in value as compared with July purchases, but less by 23.8 percent in quantity and 15.0 percent in value than in August 1952.

Purchases for the first eight months this year dropped 15.1 percent in quantity and 19.3 percent in value as compared with the January-August period in 1952.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (August and the First Eight Months of 1953 and 1952)							
QUANTITY				VALUE			
August		January-August		August		January-August	
1953	1952	1953	1952	1953	1952	1953	1952
Lbs.	Lbs.	Lbs.	Lbs.	\$	\$	\$	\$
3,048,474	3,999,589	19,114,012	22,504,070	1,425,408	1,676,942	8,269,660	10,245,608

The Army Quartermaster Corps in August 1953 paid an average price of 46.8 cents per pound for fresh and frozen fishery products, compared with 34.0 cents in July and 41.9 cents in August 1952. The over-all average price paid for the first eight months of 1953 was 43.3 cents per pound, lower than the 45.5 cents for the similar period a year earlier.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make some local purchases which are not included in the above figures. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military installations throughout the country.



Gear Research and Development

UNDERWATER LISTENING EXPERIMENTS NEAR SCHOOLS OF MENHADEN AND LITTLE TUNA: Underwater listening experiments, to determine if schools of menhaden or little tuna create any characteristic sounds by which they might be located, were carried on off the northeast coast of Florida aboard the Service's 57-foot research vessel Pompano from August 6 through September 5, 1953. The vessel is operated by the Service's Branch of Commercial Fisheries.

Although weather and poor sea conditions seriously hampered observations a good part of the time, several tape recordings were made while schools of menhaden passed directly under the vessel as it drifted. Some sounds definitely originating from marine life were observed on these occasions, but more tests are needed before it can be positively established that the sounds heard actually were produced by menhaden. In one instance the sounds picked up resembled the high-pitched squeaking of mice.

Several recordings were made while the Pompano was near surface showings of little tuna. These fish were widely scattered rather than in concentrated schools, and no significant sounds were noted. Past experience indicates that little tuna do not collect in large surface schools except during prolonged periods of good weather. The recordings will be further analyzed in the laboratory.

Noises created by other fishing craft and even the rolling of the research vessel in a sea interfered with the experiments. One problem will be the devising of a filter to eliminate or reduce these noises to permit the use of the full amplifying power of the equipment in frequency ranges in which the fish may be active.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JULY 1953, PP. 24-5.



Gulf Exploratory Fishery Program

BLUEFIN TUNA CAUGHT IN NORTHERN GULF OF MEXICO BY "OREGON:" In the north central Gulf of Mexico the first positively-identified bluefin tuna were taken by the exploratory fishing vessel Oregon during the first week in September. This particular catch was taken on live bait from a large fast-moving school. Eleven two-pound tuna were caught in one flurry; six of these were blackfin; and five were small bluefin.

Positive identification of the tunas was made at the National Museum. It is believed that this may represent the first definite recording of bluefin tuna from the northern part of the Gulf of Mexico.

The Oregon is one of the exploratory fishing vessels operated by the Service's Branch of Commercial Fisheries.



Maine

SHORT SARDINE PACK INDICATED: A continued scarcity of sardines indicates that the Maine sardine industry will end its 1953 operations on December 1 with a seriously short pack.

Hopes for a large late season production were waning as the customary plentiful September runs failed to appear, reports the Executive Secretary of the Maine Sardine Industry in a September 19 news release. Traditional fall gales and heavy seas from now on would be another important deterrent.

Many veteran cannerymen are predicting that the total pack will be less than 2,000,000 cases which, coupled with a comparatively small 1952 carry-over, could mean a definite shortage in the industry's nationwide market.

Present production of a little more than 1,000,000 cases is less than half of the 2,350,000 cases packed by mid-September last year.

"There could still be a drastic change for the better, but the way the fish are acting and other conditions make it highly doubtful," the Executive Secretary stated.

Fishing has been spotty along the entire coast since the first catches were made in May, and this has resulted in a high cost operation for the cannerymen whose plants were designed for a steady volume production.



New England Tuna Explorations

"MARJORIE PARKER" LOCATES BLUEFIN TUNA IN OFFSHORE WATERS (Cruise No. 3): A few bluefin tuna were found in the offshore waters southeast of Georges Bank and South Channel by the Service-chartered exploratory fishing vessel Marjorie Parker on a cruise completed at Portland, Maine, on September 17. Bluefin tuna were caught by commercial vessels in inshore waters at the same time in moderate numbers.

The catch of the Marjorie Parker during this 14-day trip consisted of 800 pounds of bluefin tuna, 400 pounds of mackerel shark, and one swordfish (215 pounds dressed weight). All the fish were captured on long lines, with the exception of three tuna caught on surface troll lines.

Fishing and scouting operations during the first stages of the trip were confined to the waters south and east of Georges Bank and Nantucket Lightship. No tuna were sighted in these areas and long-line sets met with negative results. Surface water temperatures ranged from 69° F. to 73° F. and bathythermographic casts showed that warm water extended to approximately 90 feet below the surface.

For three days fishing was conducted on the southwest part of Georges Bank where many small groups of tuna were observed surfacing. They appeared to be feeding on small herring and squid which were abundant in the water. While some tuna were caught on the long lines, it appeared that the fish preferred the live feed to hooks baited with frozen herring and squid.

Surface troll lines attracted a total of eight strikes but only three fish were successfully landed on deck. Best trolling was found in the southern limits of South Channel, northeast of Nantucket Lightship.

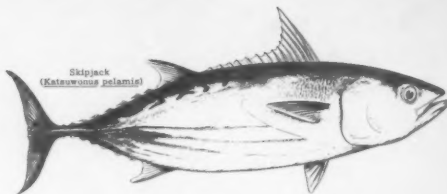
The Marjorie Parker left Portland, Maine, on September 21 on Cruise No. 4, and was scheduled to return on or about October 1. The vessel planned to work east on Cashes Ledge, and the waters of Browns Bank and the southern edge of La Havre Bank. Long lines, surface troll lines, hand lines, and surface drift gill nets were to be tested.



Pacific Oceanic Fishery Investigations

LARGE SKIPJACK TUNA CONCENTRATIONS FOUND IN HAWAIIAN AREA BY "HUGH M. SMITH" (Cruise 22): A very large school of 20-pound skipjack tuna (aku) was found about 280 miles west of Barber's Point by the Pacific Oceanic Fishery Investigations research vessel Hugh M. Smith while on a three-week cruise that was completed at Hawaii on September 22.

Experienced skipjack fishermen aboard the vessel estimated that several sampans could have taken full loads out of this one school, which was characterized as of a size met in the usual fishing grounds only about once in 5 or 6 years. Although the Hugh M. Smith had exhausted its supply of live bait before sighting the school, which was actively feeding on small opelu (mackerel scad), 1,400 pounds of skipjack were taken without bait.



Observations made on this cruise indicate that large schools of the big "season" skipjack are still abundant in Hawaiian waters.

Scouting covered four localities within 240 miles north and east of Oahu and nine localities extending as far as 360 miles to the south and west of the island. More schools of skipjack per day's sailing were observed in the southern than in the northern area. The schools to the north of the island were, however, closer in, with the greatest abundance within 60 miles of Oahu; while to the south the greatest concentrations were found about 80 miles west of Kona and out to some 300 miles south of Oahu.

Scouting results were broadcast to the commercial fishing fleet twice daily, but the areas in which schools were sighted in greatest numbers were considerably beyond the operating range of the sampans used in the fishery at present. This points up the fact that the expansion of the Hawaiian tuna industry, the ultimate objective of the program, will depend to a large extent on measures to increase the geographical area that the fleet can cover. This will mean the construction of larger and better-equipped vessels, and improvement of the navigational ability of the fishermen.

Chemical and visual attractants were tested on three skipjack schools by using macaroni and agar strips as basic materials. These were variously prepared in anchovy or skipjack extract and aluminum powder. In the case of the macaroni, some were stuffed with cotton to increase the buoyancy of the material. The few observations on the skipjack schools failed to show any apparent response by the fish to the attractants.



South Pacific Fishery Investigations

SARDINE (PILCHARD) LARVAL MORTALITY STUDY: Studies by U. S. Fish and Wildlife Service biologists show sardine larvae either suffer a high mortality rate immediately after hatching or escape through plankton net mesh and are not sampled in proportion to their true abundance. Experiments at sea are being conducted to determine which alternative is correct.

These experiments involve use of a conventional plankton net with a fine-mesh cover. Comparison of the number of larvae caught in the conventional net with the number that slip through the regular net and remain in the cover will show whether this apparent mortality is real. Existence of a "critical period" for fish immediately after hatching has long been disputed. The present experiments are among the few quantitative observations on this important problem.



U. S. Foreign Trade In Edible Fishery Products, July 1953

United States imports of fresh, frozen, and processed fish and shellfish during July 1953 totaled over 81 million pounds (valued at \$19 million), reports the July 1953 United States Foreign Trade, a Department of Commerce publication (see table). This is an increase of 12 percent in quantity and 71 percent in value when compared with imports in July 1952.

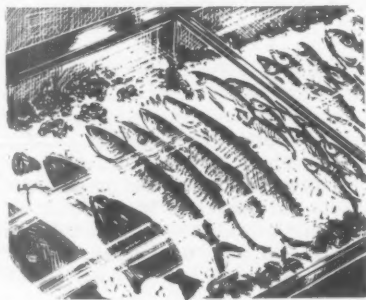
United States Foreign Trade in Edible Fishery Products, July 1953 With Comparisons						
	July 1953		July 1952		Year 1952	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	Million \$	1,000 Lbs.	Million \$	1,000 Lbs.	Million \$
Imports:						
Fish & shellfish: fresh, frozen, & processed ^{1/}	81,360	19.0	72,337	11.1	705,118	183.1
Exports:						
Fish & shellfish: processed ^{1/} only (excluding fresh and frozen)	3,988	1.1	4,928	1.2	56,604	13.5
^{1/} INCLUDES PASTES, SAUCES, CLAM CHOWDER AND JUICE, AND OTHER SPECIALTIES.						

United States exports of processed fish and shellfish (excluding fresh and frozen) in July 1953 amounted to almost 4 million pounds (valued at \$1.1 million), 19 percent less in quantity and 8 percent lower in value than a year ago.



Wholesale Prices, September 1953

A seasonal pick up in production caused September prices for edible fishery products to drop below August levels. The over-all edible fish and shellfish (fresh, frozen, and canned) wholesale index for September 1953 was 104.9 percent of the 1947-49 average (see table)--lower than August 1953 by 2.7 percent and September 1952 by 3.0 percent.



The greatest decline from August to September occurred in the drawn, dressed, or whole finfish subgroup, and the largest individual decrease was in the ex-vessel price of large haddock at Boston (20.2 percent). West Coast salmon prices went up slightly, but halibut prices dropped. Because of the Hebrew holidays, all fresh-water fish prices were substantially higher than the previous month, with the exception of lake trout at Chicago which was down 17.4 percent. Average wholesale prices in this subgroup during September were 6.7 percent below August and 12.6 percent below September 1952.

Fresh shrimp prices dropped again in September (3.4 percent), although production was only moderate. Fresh haddock fillets were also down, but shucked oysters were up 10.6 percent over August with the start of the new season. The price index for the fresh processed fish and shellfish subgroup in September was 116.2 percent--2.4 percent over August and 7.9 percent higher than September 1952.

Frozen shrimp prices like fresh shrimp prices continued to drop (5.1 percent) in September. Frozen haddock fillets and ocean perch fillets were up from August and flounder fillets remained unchanged. The index for the frozen processed fish and shell-

fish subgroup was 0.6 percent higher than August and 7.9 percent above a year earlier. All items in the subgroup were below last year, except frozen shrimp which was slightly higher.

Table 1 - Wholesale Average Prices and Revised Indexes for Edible Fish and Shellfish, September 1953 and Comparisons										
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices/ (\$)		Indexes (1947-49 = 100)					
			Sept. 1953	Aug. 1953	Sept. 1953	Aug. 1953	July 1953	Sept. 1952		
ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)										
Fresh and Frozen Fishery Products:							112.3	115.9	107.2	119.5
Drawn, Dressed, or Whole Finfish:							113.0	121.1	101.0	129.3
Haddock, large, offshore, drawn, fresh	Boston	lb.	.11	.14	114.9	144.0	87.3	110.5		
Halibut, Western, 20/80 lbs., dressed, fresh or frozen	N.Y.C.	"	.30	.31	92.3	94.4	102.9	162.5		
Salmon, king, lge. & med., dressed, fresh or frozen	"	"	.51	.50	114.2	112.1	110.7	117.5		
Whitefish, mostly Lake Superior, drawn (dressed), fresh	Chicago	"	.63	.47	154.9	116.5	112.8	223.1		
Whitefish, mostly Lake Erie pound or gill net, round, fresh	N.Y.C.	"	.74	.55	148.6	111.2	91.0	166.8		
Lake trout, domestic, mostly No. 1, drawn (dressed), fresh	Chicago	"	.48	.58	97.3	117.8	107.6	85.0		
Yellow pike, mostly Michigan (Lakes Michigan & Huron), round, fresh	N.Y.C.	"	.60	.57	140.7	132.5	143.6	167.1		
Processed, Fresh (Fish and Shellfish):							116.2	113.5	115.9	107.7
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.33	.35	112.3	117.4	93.6	103.8		
Shrimp, lge. (26-30 count), headless, fresh or frozen	N.Y.C.	"	.67	.69	105.4	109.1	124.9	94.9		
Oysters, shucked, standards	Norfolk area	gal.	5.25	4.75	129.9	117.5	111.3	123.7		
Processed, Frozen (Fish and Shellfish):							101.4	100.8	112.3	107.6
Fillets: Flounder (yellowtail), skinless, 10-lb. pkg.	Boston	lb.	.31	.31	108.7	108.7	108.7	124.4		
Haddock, sml., skins on, 10-lb. cello-pack	"	"	.25	.24	93.0	89.3	82.8	93.9		
Ocean perch, skins on, 10-lb. cello- pack	Gloucester	"	.22	.20	104.7	95.1	101.1	121.6		
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	"	.66	.69	101.1	106.5	133.4	100.3		
Canned Fishery Products:							94.0	95.9	95.5	91.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans per case	Seattle	case	17.70	18.95	93.9	100.4	100.4	93.9		
Tuna, light meat, solid pack, No. 1/2 tuna (7 oz.), 48 cans per case	Los Angeles	"	15.30	14.80	95.5	92.4	92.4	90.5		
Sardines (pilchards), Calif., tomato pack, No. 1 oval (15 oz.), 48 cans per case	"	"	9.25	9.25	108.0	108.0	108.0	109.4		
Sardines, Maine, keyless oil, No. 1/2 drawn (3 1/2 oz.), 100 cans per case	N.Y.C.	"	7.70	7.20	81.9	76.6	71.3	68.6		
1/REPRESENT AVERAGE PRICES FOR ONE DAY (MONDAY OR TUESDAY) DURING THE WEEK IN WHICH THE 15TH OF THE MONTH OCCURS.										

1/REPRESENT AVERAGE PRICES FOR ONE DAY (MONDAY OR TUESDAY) DURING THE WEEK IN WHICH THE 15TH OF THE MONTH OCCURS.

Average wholesale prices for canned fishery products dropped 2.0 percent from August to September because of lower prices for canned pink salmon. Maine sardine prices were up 6.9 percent over August because the pack was very light and production prospects for California sardines are poor. Maine sardine prices were 19.4 percent higher than a year ago. The market for canned tuna continued strong and the wholesale price advanced 3.4 percent from August to September and was 5.5 percent above a year ago. Canned pink salmon prices were 6.5 percent below August, but were at the same level as in September 1952.



Fishery Products Marketing Prospects, October-December 1953 and Outlook for 1954

Supplies of fresh and processed fishery products will be somewhat smaller during the last quarter of 1953 than for the same period last year due to reduced production and frozen fish imports for the first nine months of this year. Despite the smaller supplies, retail prices of fish and shellfish as a group may not average quite as high as in the last quarter of 1952, partly because of the lower beef prices.

FRESH AND FROZEN FISHERY PRODUCTS: Less fresh and frozen fishery products will be available for distribution this fall than last, when supplies of frozen fish were unusually large. Commercial fishing operations will decline seasonally as the year comes to a close; and the volume of landings probably will not exceed that of a year earlier unless favorable weather permits greater-than-usual fishing activity this fall. Cold-storage stocks of fishery products in the United States and Alaska on October 1 were 8 percent smaller than the record level of a year earlier. Imports of fresh and frozen fish and shellfish during the remainder of the year are not expected to equal the very large volume of the same months in 1952, partly because wholesale prices are not likely to be as favorable this year.

CANNED FISHERY PRODUCTS: Supplies of canned fishery products in the remaining weeks of 1953 will be below those of a year earlier because of the smaller packs of canned salmon and Maine sardines, and the small pack of California sardines (pilchards) in prospect. The decline in the packs of these three items will, to some extent, be offset by the expected increase over last year in the output of canned tuna and the heavier volume of canned fish imports.

OUTLOOK FOR 1954: Prospects for 1954 are that supplies of fishery products will be no larger than this year. The total volume of these commodities available for distribution during the first half of next year may not reach the January-June 1953 level, particularly for canned fish. However, depending on the outturn of the 1954 canned fish pack, the supply of all fishery products during the latter half of the year may be slightly larger than in July-December 1953. Civilian per-capita consumption of fresh and processed fish and shellfish next year is expected to total close to this year's rate. With supplies of livestock products likely to be plentiful, retail prices of fishery products in 1954 may average a little lower than for this year. However, prices for some items, especially among the canned commodities, will average somewhat higher.

Imports of fresh and processed fish and shellfish in 1954, particularly the frozen and canned commodities, probably will be at least as large as this year. Because of the relatively smaller supply of canned fish indicated for the coming winter and spring period compared with a year earlier, the United States may be a rather attractive market during those months for imported canned fishery products. Exports, on the other hand, may not be as large as in 1953, partly because of the relatively small exportable supplies of canned salmon, California sardines (pilchards), and anchovies which are popular in foreign markets, and partly because of the reluctance of many foreign countries to use any part of their dollar resources for the purchase of canned fishery products.

This analysis appeared in a report prepared by the Bureau of Agricultural Economics, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's October-December 1953 issue of the *National Food Situation*.

NOTE: THE U. S. FISH AND WILDLIFE SERVICE ALSO ISSUES A QUARTERLY OUTLOOK REPORT. THE SERVICE'S QUARTERLY OUTLOOK FOR MARKETING FISHERY PRODUCTS, OCTOBER-SEPTEMBER 1953, IS NOW AVAILABLE AS FISHERY LEAFLET 336R. COPIES ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.





International

INTER-AMERICAN TROPICAL TUNA COMMISSION

PANAMA ADHERES TO CONVENTION: Panama on September 21 deposited an instrument of adherence to the Inter-American Tropical Tuna Commission, an October 2 U. S. State Department release announced. Previously the participating countries were the United States and Costa Rica. The Convention for the Establishment of an Inter-American Tropical Tuna Commission was signed at Washington, D. C., May 31, 1949, by plenipotentiaries of the United States and Costa Rica.

By the terms of the Convention, the Commission is charged with the duty of gathering and interpreting factual information of the tuna and tuna-bait fishes of the tropical Eastern Pacific Ocean. The purpose is to maintain the populations of these fishes at levels which will permit maximum utilization year after year without depletion.

Starting on a small scale, the Tuna Commission has placed particular emphasis on two lines of research. With the cooperation of the U. S. tuna fleet it has collected both current and historical records of fishing activities. This information is basic to any fishery research. When analysis is completed it will provide some indication of the condition of the stocks. Further studies made from research vessels at sea will be necessary before the Commission can know whether regulatory measures are necessary.

The Commission has at the same time carried forward studies of the tuna-bait fishes in the Gulf of Nicoya off Costa Rica, formerly a principal source of bait fish supply for the tuna fleet. This research, conducted from Commission branch headquarters at Puntarenas, Costa Rica, definitely established the disappearance (for reasons not yet known) from the Gulf of the most important bait species, the anchoveta.

The Republic of Panama has made a gift of two boatloads of anchoveta which are now being taken from the Gulf of Panama to be transplanted in the Gulf of Nicoya in an effort to reestablish the species there.

* * * * *

PANAMA LETS COSTA RICA TAKE TUNA BAIT FOR TRANSPLANTING: The Panamanian Government has granted permission to the Costa Rican Government to take from Panamanian jurisdictional waters a quantity of tuna bait (carnada de atun) for transplanting in Costa Rican waters, a September 21 U. S. Embassy dispatch from Panama states. The project will be under the direction of scientists from the Inter-American Tropical Tuna Commission, formed by virtue of an International Fishing Convention signed in Washington, D. C., in 1949 between Costa Rica and the United States.

The Panamanian Secretary of Commerce and Industry stated that the Costa Rican expedition will take two boatloads of tuna bait for transplanting to the Costa Rican Gulf of Nicoya. He stated further that the bait will be a gift. The vessel Saragota, chartered for the purpose, was due to reach Panama on September 21.



Argentine Republic

JAPANESE FISHING VESSELS AND PROCESSING FACILITIES TO BE IMPORTED: The import of Japanese fishing boats and fish-processing facilities were reportedly being considered by an Argentine firm in negotiations with Japanese interests, a recent U. S. Embassy dispatch from Tokyo states. The plan recently publicized in the Japanese press (Nippon Keizai, July 15) provides for:

1. Establishment of a base of operation in Argentina.

2. Construction in Japan of: 2 fish carriers of 500 gross tons each, 10 trawlers of 100 gross tons each, and 5 trawlers of 60 gross tons each.

3. Fish-freezing and fish-meal manufacturing facilities.

4. Use of some Japanese fishermen and technicians for fishing and plant operations.

5. A 5-year period for development of this commercial fishing enterprise with Japanese assistance.

Prior to World War II, a Japanese firm established a branch company in Buenos Aires. Two Japanese trawlers (average 450 gross tons) with Japanese crews operated under the Argentine flag from 1936 to 1949. Fishing was in the offshore approaches to the Bay of LaPlata. The bulk of the catch was hake, but also included croakers, squid, and prawns.



UNLOADING AND PACKING FISH AT WHARF IN MAR DEL PLATA, ARGENTINA.



Burma

BURMESE-JAPANESE FIRMS PLAN JOINT FISHING ENTERPRISE OFF BURMA: A large Tokyo fishing company is reported to have recently agreed to a plan with a Burmese firm for the establishment of a joint fishery enterprise, reports a recent U. S. Embassy dispatch from Tokyo. The plan as published in the Japanese press (Nippon Keizai, July 25, and Yomiuri, August 13) provides for:

1. Capital investment: 60 percent Burmese, 40 percent Japanese.

2. Base of operations at Rangoon.

3. Deep-sea fishing by trawling in the Gulf of Martaban.

4. Charter of the Japanese company's otter trawler, Tenyo Maru No. 11 (276 gross tons).

5. Twenty fishing trips per year with an expected catch of 3,700,000 pounds annually.

6. Catch to be marketed chiefly in Burma, but with some export possibly to Japan and the United States.

7. Expansion of fishing when conditions permit by an additional 3 otter trawlers and 3 pairs of bull trawlers to be purchased from Japan.

8. The Japanese firm in addition to providing its share of the capital will supply necessary fishing materials for which payment will be paid later by the new company.

9. The new company was to be established by October 1, 1953.

In 1938 the Japanese conducted some reconnaissance trawling in the Bay of Bengal, including exploration along the coast of Burma. Some fish caught by this expedition was frozen and part of it sold at Rangoon and Calcutta.



Canada

BRITISH COLUMBIA SALMON PACK UP: The salmon pack in British Columbia as of October 3, 1953, totaled 1,690,343 cases (48 1-lb. cans) as compared with 1,258,084 cases for the corresponding period of 1952, reports a September 15 U. S. consular dispatch from Vancouver. The remarkable feature about this year's pack has been the large proportion of sockeye caught in the Fraser River which is attributed to the efficacy and value of the fishways at Hell's Gate and efficient planning of the fishery's restoration. The sockeye pack is slightly over 509,000 cases, but from a marketing standpoint packers would probably have been as well satisfied with 150,000 fewer cases of sockeye and a corresponding increase in the pack of pink salmon.

It is hoped that as a result of the carefully planned advertising campaign the domestic market will absorb two-thirds of the pack.



Colombia

NAVY TO CONTROL OCEAN FISHING: The Colombian Government by Decree No. 2269 of August 31, 1953, transferred control over ocean fishing from the Ministry of Agriculture to the National Navy, reports a September 18 United States Embassy dispatch from Bogota.

The control of ocean fishing, including the issuance of ocean-fishing licenses, will henceforth be the responsibility of the Colombian Navy. It may impose temporary or permanent prohibitions, limit the number of vessels engaged in the industry, and specify the fishing periods, methods, and equipment that may be used.

The officers charged with the carrying out of the provisions of the subject decree in Colombian ports will be named by the Ministry of War from the active personnel of the Colombian Navy.

Biological studies of maritime fauna will be carried on by the Ministry of Agriculture.

There has been considerable newspaper comment regarding alleged illegal fishing in Colombian territorial waters by foreign vessels. Placing the control of ocean fishing under the Colombian Navy is designed to insure better enforcement of

the fishing regulations. The effect on fishing in Colombian waters by non-Colombian entities cannot be determined definitely until the Navy has issued its regulations. It is believed that a more determined effort will be made henceforth to control alleged illegal foreign fishing in Colombian territorial waters.

Formosa (Nationalist China)

FISHERIES STATUS: The Formosan fisheries production goal for 1953 was announced by the Ministry of Economic Affairs to have been set at 140,250 metric tons as compared with the 1952 catch of 121,697 tons (seetable), reports a July 20 U.S. Embassy dispatch from Taipei, Taiwan.

Formosa's Fisheries: Production Goal For 1953 and Catch For 1952		
Type of Fisheries	1953 Goal Metric Tons	1952 Catch Metric Tons
Deep sea	32,000	18,515
Inshore	35,800	29,696
Coastal	42,300	43,966
Fish culture	30,150	29,580
Total	140,250	121,697

With a view to attaining the 1953 goal, which is about 15 percent higher than the 1952 catch, the following measures were announced to boost production:

1. Fishermen's insurance against injury, disability, death, and old age was introduced on March 1, following the promulgation by the Provincial Government of the "Fishermen's Insurance Measures" on February 28.

2. A "fishing boats for fishermen" program was mapped out by the Provincial Government to build 87 small motorized fishing boats—50 of 5 tons, 32 of 10 tons, and 5 of 15 tons to be sold to groups of fishermen who may pay for the boats in 18 monthly installments starting from the third month after delivery. Each 5-ton boat is to be sold to a group of 4 or more fishermen, each 10-ton boat to a group of 6 or more, and each 15-ton boat to a group of 8 or more. To finance this program the Government earmarked a loan of NT\$1.9 million (US\$184,000) and CUSA has taken steps to appropriate a loan of NT\$4 million (US\$388,000) and US\$100,000 to be spent on importing Diesel engines for the boats. Construction of the boats had already been started, and delivery to fishermen was scheduled for August.

3. Various programs were announced to extend financial assistance for improving or developing facilities of the fishing industry. A NT\$4-million (US\$388,000) loan was granted for repairing fishing boats; US\$200,000 for purchasing fishing equipment; NT\$5 million (US\$485,000) distributed to local governments as subsidy for rehabilitating fishing ports. Other programs planned for include US\$1.5 million in loans and subsidies for developing deep-sea fishery, NT\$7 million (US\$680,000) for purchasing small motor fishing boats, and for improving cold-storage facilities and expanding experimental and inspection facilities.

The Chinese Government was considering the advisability of reviving the whaling industry in Formosa. The Government inquired into the prospects for admission into the International Whaling Association, which will qualify Nationalist China for procuring whaling ships and equipment from member countries. A favorable reply was received from the IWA in mid-March. However, no further development has been announced.

On March 25 the Executive Yuan approved a proposed contract between a Japanese fishing firm and the Fisheries Administration of the Ministry of Economic Affairs

and two other Government fisheries concerns for technical cooperation in mackerel fishing. This contract, signed April 1, marked the first postwar Sino-Japanese fisheries cooperation whereby two Japanese fishing vessels will operate in the Suso area and at the same time train Chinese technicians in mackerel fishing techniques and thus contribute to developing Formosa's inshore fisheries.



France

SALT COD FISHERY FACING CRISIS: French Grand Banks trawlers fishing for cod fail to clear their operating costs in some cases, according to a recent article in *Le Marin*, a French trade newspaper. The article points out the existence of a crisis in the salt cod trade that but for the outbreak of the Korean War in 1950 would have become apparent 3 years earlier. Regulation of this fishery has been proposed. It has been suggested that fishing operations should be discontinued on November 1, 1953, until February 15, 1954.



MODERN FRENCH STEEL TRAWLER AT
BOULOGNE-SUR-MER.

Another article in the same newspaper notes that there is a marketing crisis in the salt cod industry, occasioned at least in part by the small size of the fish now being landed by the distant-water trawlers, and also by the trend away from salt fish in consumer preference. It was believed that freezing fish at sea would be the salvation of the distant-water fleets that comprise only some 40 vessels and are threatened with further reduction. Two vessel owners are reported to plan the construction of one freezer-trawler each.



Greece

VESSEL TRAWLS AT 380-FATHOM DEPTH: The Greek trawler *Nautilus* recently returned to port with a catch of about 800 pounds of cod trawled from a depth of 380 fathoms, according to the July 1953 *Aleia*, a Greek trade magazine. Where the boat fished was not reported.



India

TUNA FISHERY IN SOUTHWEST AREA: Tuna occurs along the Southwest coast of India between Colachel in the south and Quilon in the north, reports a July 16 U. S. consular dispatch from Madras. The commercial catch of tuna in this area consists of the *Euthynnus* species according to the State Government of Travancore-Cochin. The *Euthynnus* occurs in two different seasons during the year; from March to May and from October to December. Vital statistics of this species are as follows:

Species	Length			Average weight
	Minimum	Maximum	Average	
	<u>Cm.</u>	<u>Cm.</u>	<u>Cm.</u>	<u>Lbs.</u>
<i>Euthynnus</i>	30	66	57	6

There are no authentic data on the quantities of tuna landed. The landings, however, during this season were approximately 74 metric tons of Euthynnus. The present landings cannot insure a steady supply to feed a canning plant. There are no facilities for freezing fish.



Indonesia

ECA-SUPPLIED FISHING VESSELS OPERATE WELL: An investigation on the end-use of fishing vessels supplied to Indonesia by the Economic Cooperation Administration (now Mutual Security Agency) revealed that all vessels inspected showed very satisfactory operating records, according to a June 27 U. S. Embassy dispatch from Djakarta. These vessels have increased catches and improved the welfare of the operators.

The Indonesian Seafisheries Service distributed the vessels over a wide area, primarily for their value in stimulating, via actual demonstration, a broad interest in motorization. This was carried out at considerable expense to the Indonesian Government. However, the actual demonstration of the efficiency of motorized vessels, which was the goal sought, has been achieved, plus an appreciable increase in the food supply.

The quality of the Indonesian teakwood vessels has stimulated the local industry to the point where no further importation of vessels is contemplated or necessary.

Motorized fishing vessels' captains and crews invariably reported five to ten times their former earnings. This has stimulated the Indonesian fisheries toward rapid motorization. Also, this means that in the near future the total catch of fish will be raised by a proportionate figure.

Although some of the ECA-financed fishing vessels are still being operated by the Seafisheries Institute, plans are being effected at the present time to turn all the vessels over to the cooperatives. The delay has been due to the necessity for training crews and building up the shore installations for marketing the fish in the areas where they will operate.

The 75 fishing craft covered in this report contributed from November 1951 to January 1953 a total of 1,767,755 kilograms of fish with a landed value of 3,710,937 rupiah (3,889,000 lbs. valued at US\$315,000). Considering that 37 of these boats (30 majang, 7 bonito) were relatively non-productive during 1952, the Seafisheries Service is predicting a substantial increase for 1953.

In addition, during 1952 somewhere in the neighborhood of 50 locally-built boats with ECA motors in them had been distributed and were fishing.

The two tuna clippers supplied by ECA in 1952 were visited by those conducting the survey. The Seni Leba was stationed at Bali, where it planned to exploit the waters of the Lesser Sundas in search of bait fish and yellowfin tuna. The Seni Rosi was stationed at Air Tembaga, where recently new copper sheathing was installed and the engines overhauled. This vessel is scheduled to be stationed at Makassar in 1953 and to be joined there later by the Seni Leba. At the time of the reporter's visit to the Seni Leba, the training of the Indonesian engineers was about 70 percent complete and the training of the fishermen about 50 percent complete. On the Seni Rosi, due to the fact that there is no fishing instructor assigned to the boat and

the fact that the contract engineer had left the boat in November, the training of the engineers was 40 percent complete and that of the fishermen less than 15 percent. Very recently an engineer-instructor was placed under contract and assigned to the Seni Rosi and a fishing instructor is now being recruited.

The bonito fisheries in Ambon have a remarkably high production compared with that of Air Tembaga. The fishermen in this port, according to the Chief of the Sea-fisheries Service Station and as indicated by the catch records, are averaging about 16 rupiah (US\$1.36) per day, which is more than twice as much as it is possible to earn on sailing prehus. This is the only port where the practice is followed of giving the fishermen free fish in addition to their shares. This is probably due to the abundance of bonito. On catches up to 200 fish, each fisherman is entitled to take one fish. When the catch is over 200 fish but less than 500, each man is given two fish, and when the catch runs greater than 500 each man is entitled to a maximum of four fish to take home.



Japan

CANNED TUNA EXPORT PRICES RISE AGAIN: The latest prices for Japanese canned tuna for export to the United States were announced on August 28 by the Tokyo Canned Tuna Sales Company, the principal source of supply for Japanese exporters to the United States market, a September 24 U. S. Embassy dispatch from Tokyo reports. The latest previous increases were announced on August 12. The new prices as compared with the old are:

Japanese Canned Tuna Export Prices (Announced on August 28, 1953)					
Item	Case & Can Size	New Prices ^{1/}		Old Prices ^{1/}	
		In brine	In oil	In brine	In oil
		US\$ Per Case	US\$ Per Case	US\$ Per Case	US\$ Per Case
White meat tuna (albacore), solid pack...	48/3½-oz.	5.95	6.05	5.85	5.95
"	48/7-oz.	10.00	10.10	9.90	10.00
"	24/13-oz.	9.15	9.25	9.00	9.10
"	6/2-kg.	10.80	10.90	10.50	10.60
(albacore), flakes....	48/6½-oz.	8.00	8.10	7.90	8.00
Light meat tuna (skipjack, yellowfin, or other tunas)					
Solid pack..	48/3½-oz.	5.45	5.55	5.35	5.45
"	48/7-oz.	8.90	9.00	8.60	8.70
"	24/13-oz.	8.25	8.35	7.85	7.95
"	6/2-kg.	9.70	9.80	9.25	9.35
" flakes....	48/6½-oz.	7.10	7.20	6.90	7.00

^{1/}INCLUDE 2-PERCENT COMMISSION FOR EXPORTERS.

As of September 9 the demand for canned tuna in United States markets was reported brisk. Japanese exports to these markets were reported to be 150,000 cases (48/7-oz. cans). The Tokyo Canned Tuna Sales Company up to September 9 received 1,180,000 cases of tuna from the packers (presumably since January 1953) and had sold 970,000 cases to exporters. As of August 31 a total of 760,444 cases have been reportedly licensed for export.

Exports for the period April-August 1953 were announced as 28,679 tons licensed, of which 28,673 tons have been actually loaded aboard ships.

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EXPORTS OF FISHERY PRODUCTS, JANUARY-JUNE 1953: Japanese exports of fish and marine products to all countries for the first six months of 1953 reached 57,245 metric tons (126,202,000 lbs.) and an estimated export value of US\$27,797,000 (4.6

Table 1 - Japanese Exports of Canned Tuna (Solid Pack) November 1952-May 1953								
Month	White meat in brine		White meat in oil		Light meat in brine		Light meat in oil	
	United States	Other Countries	United States	Other Countries	United States	Other Countries	United States	Other Countries
..... (In standard cases (48/7-oz. cans each)								
1952:								
November.....	31,611	409	8,950	6,338	26,382	-	-	5,490
December.....	43,983	1,386	12,436	5,219	998	-	-	5,998
1953:								
January.....	71,959	-	27,472	-	6,099	-	-	-
February.....	101,404	314	53,902	17,105	8,759	964	-	6,139
March.....	88,481	72	17,138	4,157	6,874	-	-	4,120
April 1/.....	28,541	2/	3,203	2/	3,377	2/	-	2/
May.....	84,170	2/	4,130	2/	13,532	2/	39	2/

1/INCLUDES 3,219 CASES WHICH WERE NOT DEFINITELY CLASSIFIED AS WHITE-MEAT TUNA.

2/NOT AVAILABLE.

percent of the total value of all exports). The major portion of the fishery products exported were fresh and frozen and canned tuna to the United States, reports a recent U. S. Embassy dispatch from Tokyo.

Japanese exports of fresh, frozen, and canned tuna, canned crab meat, and other canned fish to the United States in the first 6 months of 1953 amounted to 73,351,000 pounds with an export value of US\$22,522,000. The leading item was fro-

Table 2 - Japanese Exports of Canned Tuna to United States		
Month	1953	1952
	Actual Cases	Actual Cases
January.....	69,530	65,408
February.....	142,121	68,148
March.....	86,223	78,942
April.....	54,890	66,583
May.....	69,445	56,215
June.....	172,764	41,902
Total.....	594,973	377,198

Table 3 - Japanese Exports of Canned Tuna (Solid Pack) by Can and Case Size to United States ¹			
Case and Can Size	January-June 1953		January-June 1952
	Actual Cases		Actual Cases
48 3½ oz.	6,190		1,000
48 7 oz.	450,327		286,097
24 13 oz.	36,716		33,238
6 4.4 lbs.	101,152		56,863
Total	594,973		377,198

1/NO RECORD AVAILABLE OF EXPORTS OF FLAKES PACK PUT UP IN 6½-oz. cans, 48 TO THE CASE.

zen tuna--50,078,000 pounds (estimated export value US\$9,014,000); followed by canned tuna 9,855,000 pounds (value US\$3,453,000), canned crab meat 1,411,000 pounds (value US\$3,586,000), and other canned fish 14,819,000 pounds (value US\$6,975,000).

Table 4 - Japanese Exports of Frozen Tuna, January-June 1953 and 1952				
Month	1953		1952	
	United States	Other countries	United States	Other countries
..... (Short Tons)				
January.....	398	150	2,831	35
February.....	2,958	175	1,361	-
March.....	3,856	-	2,208	-
April.....	3,167	-	1,100	-
May.....	2,358	50	1,301	-
June.....	12,302	-	6,590	300
Total.....	25,039	375	15,391	335

In addition, 6,216,000 pounds (value US\$2,516,000) of fish and marine animal oils were exported to the United States during the same period.

Table 1 gives the Japanese exports of canned tuna to all countries by type of pack for November 1952-May 1953 in standard cases; table 2 gives the Japanese exports of canned tuna to the United States in actual cases for January-June 1952 and 1953; table 3 gives the Japanese exports of canned tuna by can and case size in actual cases for January-June 1952 and 1953. Table 4 shows the Japanese exports of frozen tuna for January-June 1953 and 1952.

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TUNA MOTHERSHIP EXPEDITIONS: "Tenyo Maru" Expedition: The tuna expedition headed by the mothership Tenyo Maru as of September 1 reported its catch as 12,488,500 pounds, exceeding its goal of 12,405,000 pounds, reports a September 24 U. S. Embassy dispatch from Tokyo. The catch consisted of: yellowfin tuna 6,827,082 pounds, other tunas 1,370,819 pounds, swordfish 2,312,912 pounds, shark 1,957,211 pounds, and other species 20,476 pounds. Operations ended on September 4 and the Tenyo Maru arrived in Tokyo on September 14.



A JAPANESE TUNA CATCHER BOAT TIED UP TO A MOTHERSHIP.

This expedition operated with one mothership (11,224 gross tons), 30 catcher boats (average 130 gross tons), and 2 carriers (1,000 gross tons). Operations were originally scheduled to end in mid-September.

"Tone Maru" Expedition: A smaller tuna expedition operated in the Gilbert Islands region. It consisted of the modified otter trawler Tone Maru (535 gross tons), working with the regular tuna-type boat the Kashima Maru (99 gross tons). Fishing began mid-July and ended August 12. A preliminary re-

port indicates a total catch of 349,581 pounds: The catch consisted of yellowfin tuna fillets for export, 156,300 pounds; yellowfin tuna for domestic market, 38,125 pounds; big-eyed tuna, 32,038 pounds; swordfish, 85,966 pounds; shark, 17,384 pounds; flake meat, 19,228 pounds; other species, 538 pounds.

"Saipan" Expedition: The tuna fleet led by the mothership Saipan (3,000 gross tons) was operating in the region of the Gilbert Islands. This fleet began fishing in early August with 6 small deck-loaded catchers (average 12 gross tons) and 7 larger catchers (100 gross-ton class). The catch is reported equal to production estimates at the time the fleet was organized.

As of mid-September the catch amounted to approximately 1,406,000 pounds of which 827,000 pounds was yellowfin tuna, 82,700 pounds albacore, and the remainder other tunas and sharks. A small Japanese carrier was scheduled to rendezvous with the Saipan to transfer the catch from the mothership for transport to Japan. The Saipan and her catchers were scheduled to continue fishing until the middle of October, and were to return to Japan in early November. Much of the fish is earmarked for export as frozen tuna. The Saipan, purchased from a United States firm earlier in the year, is on its first Japanese tuna operation.

* * * * *

SHRIMP FISHING OFF CENTRAL AMERICA: A large Japanese firm has reportedly completed arrangements to engage in shrimp fishing along the Pacific Coast of Central America, reports a recent U. S. Embassy dispatch from Tokyo. Operations will be based at Puntarenas, Costa Rica, and are expected to begin in early October. The Japanese firm has entered into an agreement with a refrigeration company in Costa Rica. The agreement provides for fishing rights over a two-year period and the use of facilities at Puntarenas.

Two Japanese trawlers, the Tokai Maru No. 13 and Tokai Maru No. 15 (averaging 98 gross tons each), were scheduled to sail from Japan about the middle of August, arriving at Costa Rica about the end of September. Shrimp fishing will be during the seasonal period, October-March; trawling for bottom fish will be carried on after the shrimp season. An annual catch of at least 250 tons of shrimp is anticipated. The catch will be exported to the United States through the Costa Rican refrigeration company.

Prior to World War II, Japanese-owned trawlers operated from bases in Mexico in the Gulf of California and in the Gulf of Mexico. The catch was principally shrimp, some of which was frozen and shipped to Japan; some was sold in the U. S. markets. These operations, which began in 1935 and extended until 1941, were in part exploratory. Six trawlers were engaged from 1939 to 1941. The records show that a little exploratory fishing was done off Costa Rica in the prewar years, but not from land bases in that country.

FISHERIES LAW AMENDED: The Fisheries Law, which provides for the establishment of a fundamental system for the administration, development, and democratization of the Japanese fisheries, was amended on July 28, 1953. The original law was passed by the Diet in November 1949, reports an August 27 U. S. Embassy dispatch from Tokyo. The amendment deletes that part of the law requiring the payment of fishing right fees or license fees.

The amendment is especially significant because it eliminates the Government's means to collect funds from the fishermen to cover the cost of payments by the Government in compensation for fishing rights to former holders of these rights. Cancellation and redistribution of these rights was the principal feature of the Fisheries Law. The Government has already paid to former right holders approximately 18.5 billion yen (US\$51,000,000). Payment of right and license fees was begun in 1952. The Government expected to collect 605,000,000 yen (US\$1,700,000) in that year. Continued annual payments were planned over a 25-year period. As of May 1, 1953, only 38 percent of the 1952 amount had been collected. The fishermen and other operators have stalled or otherwise been delinquent in their payments. Now that the law has been amended there is little hope of collecting the balance due.

Consideration is being given to reestablishing local fishery taxes, a system in effect prior to the Fisheries Law. The rates of such local taxes have not been determined as yet nor has appropriate legislation been drafted for reestablishing this system. A system of local taxes would represent a marked difference in fishing costs as compared to the rights and license fees which are now abolished.



Malaya

SHRIMP FISHING: Nearly all the coastal dwellers in Malaya are fishermen, and many specialize in shrimp fishing, according to the September 1953 World Fishing, a British Trade magazine. The shrimp season is about 8 months long and during this time the fishermen go out at each change of the tide to the grounds a few miles offshore. Just before high tide, the crew of two or three get into their boat, specially imported from China, and fit the outboard motor. These motors are in common use. The boat leaves the village at the mouth of the river and sails to the sea, and after half an hour's run it reaches the bobbing poles which act both as floats and markers for the nets.

These nets are funnel-shaped, and with the motion of the sea, the shrimp flow along into a sack at the small end. This sack is brought to the surface, the end is untied, and into a wicker creel spill perhaps 30 or 40 pounds of assorted fish. The little fish and the sea snake, the octopus and the jellyfish are removed, and the rest, mainly shrimp, are emptied into the boat. The net is then turned to catch the ebb tide, and the boat moves on to the next net, there being six or seven nets in each ground.

The catch is then taken back to the village where any remaining odds and ends, such as small crabs and eels, are picked out. The shrimp are boiled for 5 to 10 minutes and then spread out in the sun to dry. Next day they are put in a bag and beaten to separate the shells, which make excellent fertilizer. Nothing is wasted.

The shrimp bring an average of 2s. 6d. (35 U.S. cents) per pound and a good catch may weigh 550 to 675 pounds though it is generally nearer 100 to 150 pounds. Overhead, of course, is high; the boats and nets come from China, and every other week the nets have to be taken up and mended and dried. They are proofed against rot by boiling in an infusion of mangrove bark. At the end of the week shrimp fishing starts again. Four times a day, at each turn of the tide, the Chinese and Malay fishermen go out after shrimp.



Norway

MEAL PLANTS INSTALL EQUIPMENT FOR FISH SOLUBLES: A Norwegian company which specializes in equipment for making fish solubles from stickwater has announced that 15 units are being installed in Norwegian fish-meal plants. In addition, the company reports that orders for two complete units have been received from South Africa, reports the Norwegian Information Service in a September 24 release.



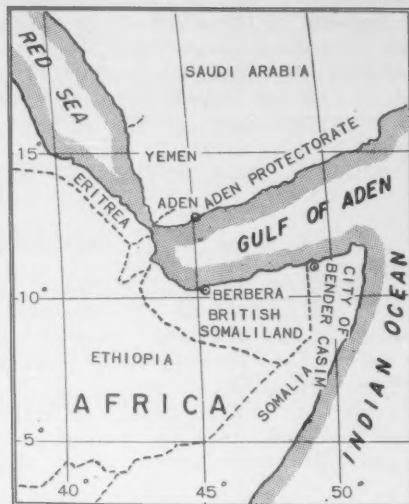
Somalia

FAO TEAM DEMONSTRATES TUNA FISHING METHODS: A team of Food and Agriculture Organization (FAO) experts in May 1953 demonstrated bait fishing for tuna in the Gulf of Aden with the use of a California tuna vessel—New Hope, reports an August bulletin from that agency. The vessel, chartered by FAO, was equipped with radio, direction finder, photoelectric pilot, Diesel engine, refrigeration, bait tank, and facilities for several kinds of fishing.

The operation of the vessel was part of a survey by FAO experts to develop Somalia's fishery resources and production in the Gulf of Aden. The survey revealed that only the fringe of a large tuna population was being exploited by fishermen from Somalia.

Already one cannery in Somalia has asked for guidance in installing a bait tank on one of its vessels next season, and there is little doubt that the New Hope's successful bait-catching technique will be emulated all along the coast.

At some times, when the tuna are feeding near the surface, trolling is an important means of taking them. FAO demonstrated the technique of multiple trolling, by which, with the help of long "tango" poles, seven or more lines may be used at a time. Rigged with this gear, the New Hope caught in one day ten times as much tuna as the whole fishing fleet of Bender Cassim. The small local dug-out canoes can also use multiple trolling if they are fitted with outriggers to make them more stable. To demonstrate this, one of the local craft was fitted with an outrigger float. This craft aroused keen interest, and some of the canneries intend to construct similar ones for their fishermen so they can troll with seven lines next season.

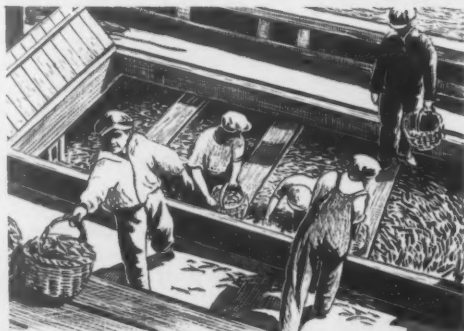


Somalia wants FAO experts to return for the 1953/54 season, when the chances are that the yellowfin tuna, very scarce this season, will reappear in quantity. It is hoped that the use of multiple trolling, live bait, long line, and the adaptation and mechanization of fishing craft will result in a sizable pack.



Spain

MORE FISH CANNERIES ESTABLISHED: The opening of a fish canning factory at Malaga by a Vigo firm and the establishment in the near future of five more factories at the same place by Vigo firms and an El Grove firm, the press reported on September 6. This is attributed to favorable sardine runs in the Mediterranean. Sardines have been successfully trucked from Malaga to Vigo by several Galician factories.



UNLOADING SARDINES FROM THE HOLD OF A SPANISH SARDINE AUXILIARY CRAFT.

August was a much better month for the fish canning industry than the same month a year ago, reports a September 18 U. S. consular dispatch from Vigo. Production, however, was less than the potential due to uncertainty among the canners because the Government did not act on the industry's appeals for a more favorable export exchange rate.

CRISIS IN THE FISHING INDUSTRY: The Spanish fishing industry can be saved from its "worsening" crisis only by direct and immediate action of the Government, according to press reports. The principal causes of this crisis have been the disappearance of sardine runs from the Galician littoral (this species is basic to the economy of the short-range fishing fleet and to the fish canning industry); ever-increasing distances to the fishing grounds of the long-range fleet; the need of modernizing the fleet in general; increased operating costs; the lack of enforcement of fishing regulations and the need of revising such regulations; and the need of a more realistic export exchange rate and other aids to the canning industry.



Spanish Morocco

CANNED AND SALTED FISH PRODUCTION, 1952: The total Spanish Moroccan production of canned fish in 1952 amounted to 3,700 metric tons, valued at 70 million pesetas (US\$1.8 million), reports a June 22 U. S. Legation dispatch from Tangier. The salted fish production in 1952 totaled 3,300 metric tons, valued at 3 million pesetas (US\$76,000).

NOTE: VALUES CONVERTED ON THE BASIS OF 39.65 PESETAS EQUAL US\$1.

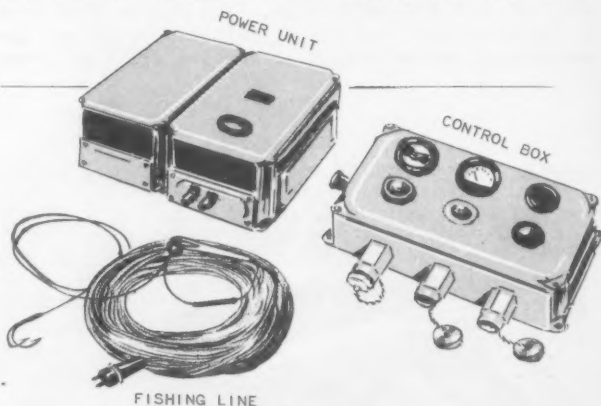


Sweden

EXPORT OF ELECTRICAL TUNA-FISHING UNITS PLANNED: A Goteborg manufacturer has signed a contract with the German inventor of the "tuna shock," an electrical tuna-fishing device. The Swedish manufacturer will make about 200 units each year, mostly for export, an August 31 U. S. consular dispatch from Goteborg reports. This season only 30 units have been produced, and one was for export to Denmark. Peruvian interests are also considering the "tuna shock" for swordfish fishing.

About ten Swedish fishing vessels have now tried the electric fishing method and the crew members seem to be very satisfied.

The fishing vessel Skantic of Ockero arrived in Goteborg recently with 24 tuna caught with the "tuna shock." Twenty of these were caught in one day, and the largest one weighed 575 pounds.



THE SWEDISH "TUNA SHOCK" ELECTRIC UNIT.

"It is fun to fish with electricity and the risks are not so great," the Skantic crew members stated. "We had a few bouncers which got away and one woke up

after the shock when it was on the deck. That was before we had time to kill it. The tuna flapped about wildly and made a hole in the planking with its jaws."

The electric "tuna shock" unit does not occupy much room. It consists of one converter; one maneuvering box connected with three cables to as many lines and special hooks. Three lines can be fished at the same time. The lines have floats in different colors and when one of the floats disappears indicating a bite, the electric current, which renders the fish unconscious, is connected by pressing the contact button in the maneuvering box. The current from the vessel's 24-volt battery is converted so that about 200 volts goes out to the hook when the fish bites. That makes 80 to 90 amperes in the top shocks. A series of shocks of 4 to 5 seconds are enough to make the fish unconscious. After that it is pulled in and lifted aboard with the winch.

To prevent any members of the crew from receiving shocks, there is a locking device. The hook must be in the water otherwise the electric current has no effect. It is not necessary to use a very heavy hook, thus improving the fishing possibilities, as tuna are very shy.

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FILLET PRODUCTION, 1952: Swedish production of fish fillets in 1952 amounted to 6,000 metric tons, reports an August 14 U. S. Embassy dispatch from Goteborg. Of this total, 5,800 tons were cod and haddock, and 200 tons flounder fillets.

FILLET EXPORTS, 1949-51: Swedish exports of fish fillets in 1951 totaled 275 metric tons as compared to 690 tons in 1950 and 1,025 tons in 1949. There was no appreciable amount of fish fillets exported to the United States during these years.



United Kingdom

NEW METHODS DEVELOPED FOR QUICK-FREEZING FISH AT SEA: New methods of quick-freezing fish at sea developed by the Torry Research Station, Aberdeen, Scotland, are to be tested on a distant-water commercial trawler, reports the September 1953 World Fishing, a British trade magazine. The equipment has already been tried on the Government's research vessel, and arrangements are being discussed with the White Fish Authority and the distant-water industry to equip a suitable commercial vessel with the type of equipment tried out on the Government research vessel.

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COD-FISHING TRAWLERS USING LARGER-MESH NETS IN BARENTS SEA: Most of the British trawlers fishing for cod on the Bear Island grounds in the Barents Sea are now using a larger-mesh net to prevent these prolific fishing grounds from being "fished out," reports the August 22 Fish Trades Gazette, a British trade magazine. Catches at Bear Island have not been as heavy as they were some years ago and with the increasing number of vessels fishing there is good reason for apprehension about the future.

It will be remembered what happened to the North Sea, once thought to have inexhaustible supplies of fish, which was quickly depleted by overfishing in spite of the fallow periods of two world wars.

In view of these fears, the experiments which have been carried out by Northern Trawlers, Ltd., of Grimsby, in the use of a trawl of larger mesh than the normal, is

of particular interest, as the bigger mesh enables the smaller fish to get away and so has a material value in the conservation of small fish.

A representative of Northern Trawlers, Ltd., said he had read of careful experiments in the same direction which had been made in the United States and considering it to be sound common sense decided to try the idea of a bigger mesh. "At first, our skippers were dead against it," he said. "They said it had been tried and had not been a success, but I decided to try it for myself."

The new net has a mesh of 5-3/8 inches, over an inch more than the regulation mesh of 4-5/16 inches.

The first big mesh nets were enclosed in a bag of old herring net and soon proved that the small fish were getting through the larger mesh. In effect, the bigger mesh graded the fish automatically, retaining in the trawl a higher proportion of marketable fish. With the older gear, up to two-thirds of every catch was of undersized fish which had to be sorted out and thrown overboard—most of them dead.

The experiments have proved so successful that most of the ships of the northern fleet are now equipped with the new nets for the Bear Island grounds.

The new nets are useful only for Bear Island, said the Northern Trawlers' representative. "There we are out for cod and the bigger mesh is valuable. We may go in for even bigger mesh nets yet."

With the new trawls retaining less fish than the older ones of smaller mesh, it has been found that the nets can be towed longer between hauls and there is much less labor for crews in sorting out the catch.

The catches of the vessels fitted with the new trawls had certainly not diminished, and they were landing a larger and more uniform size of fish.

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BRITISH-FRENCH SHRIMP FISHING DISPUTE: Harwich (England) shrimp fishermen allege that French shrimp boats have "invaded" their traditional grounds, 7 miles from Harwich, according to the September 1953 World Fishing, a British fishery magazine. As their grounds are, of course, outside territorial limits, it is believed that no steps can be taken to stop the French encroaching, but feeling is high because the Harwich fishermen say the grounds have always been theirs and the catches are now much smaller as a consequence of the French depredations. The French vessels are said to be faster and more modern than their English counterparts.

Precautions have been taken to insure that the French catches are not landed in Essex, England, to be sold in competition with the local fishermen.



Venezuela

FISHERIES REVIEW, 1952: The total catch of the Venezuelan commercial fishing industry in 1952 amounted to 50,564 metric tons, approximately the same as in 1951, reports the September 26 Foreign Trade, a Canadian Government publication.

The import duties on canned sardines and salmon were raised to 28 cents per gross pound through the United States-Venezuelan Trade Agreement of August 1952.

This action reduced Venezuelan imports of canned sardines to one-third of their former level, thus aiding the national sardine industry. Imports of canned salmon



BOAT FOR TRANSPORTING SARDINES, CUMANA, VENEZUELA.

in 1952 amounted to 383,000 pounds, continuing at the same rate as in previous years. Cod imports, which also pay a 28-cents-per-pound duty, totaled 1,060,000 pounds as compared with 1,014,000 pounds in 1951.

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FISH BUYERS SEEK FIXED PRICES: Fish buy-boat operators have called a meeting to ask the Venezuelan Government to fix fish prices, reports an August 21 U. S. Embassy dispatch from Caracas. These buy-boat operators claim that on the average 50 metric tons of fish arrive at the port of La Guaira each week. The fish are packed in ice but it is claimed that at times cargoes are held for as long as ten days before the fish are sold.

There are reported to be 150 boats engaged in buying fish from the fishermen and competition has eliminated profits, and in many cases there are losses.

The operators ask a stable price which will produce neither an excess nor a scarcity but one fixed to insure a profit to the boat owners and a fair price to consumers.





Department of Agriculture

U. S. NOMINEE FOR DIRECTOR-GENERAL OF FAO: Dr. P. V. Cardon, one of America's leading agricultural scientists and research administrators, will be the nominee of the United States for the Director-Generalship of the Food and Agriculture Organization of the United Nations when that Organization holds its Seventh General Session in Rome in November. This announcement was made by the Secretary of Agriculture on September 28.

The nominee is former Administrator of the Agricultural Research Administration in the U. S. Department of Agriculture. His career has been devoted to agriculture, and his intensive and varied experience has included State, National, and international work. He has been active in the development of FAO since the very beginning, and has had a major role in the shaping of its policies.

Under the procedure of the FAO, the U. S. Delegation to the Seventh Session in November will submit formally the name of Dr. Cardon as a candidate for the Director-Generalship. The member countries of FAO will elect a Director-General by majority vote.

The present Director-General is N. E. Dodd of Oregon. He has been Director-General since 1948, and his present term expires this year.



Civil Service Commission

FISHERY MARKETING SPECIALIST EXAMINATION ANNOUNCED: An examination for Fishery Marketing Specialist (GS-5, \$3,410 a year) was announced by the U. S. Civil Service Commission on October 27, 1953 (Announcement No. 385). The register established from this examination will be used to fill positions in the Fish and Wildlife Service of the Department of the Interior in Washington, D. C., and throughout the United States. However, this same examination may be used to fill positions in other Federal agencies in Washington, D. C., and vicinity. The closing date for this examination is December 29, 1953.

Announcement No. 385 (dated October 27, 1953) giving full details and information and application blanks are obtainable from the U. S. Civil Service Commission, Washington 25, D. C., from any of the Commission's regional offices, or from any first- or second-class post office.



Department of Commerce

BUREAU OF FOREIGN COMMERCE ESTABLISHED: The establishment of the Bureau of Foreign Commerce as a primary organization unit of the Department of Commerce was announced by the Secretary of Commerce on October 14.

The new Bureau takes over the functions heretofore performed by the Office of International Trade which was responsible for a variety of services to business in the field of foreign trade and investment. It also will be responsible for administering export control operations.

In addition to carrying on the Department's established informational services and other trade promotional work, the new Bureau will give increased attention to the promotion of private foreign investment. It will work closely with the newly-established Business and Defense Services Administration in the development and execution of its programs and activities.

There will be three major offices in the Bureau of Foreign Commerce: the Office of Export Supply, responsible for export licensing activities; the Office of Economic Affairs, responsible for country information; and the Office of Intelligence and Services, responsible for commercial intelligence and special trade development services.



Treasury Department

BUREAU OF CUSTOMS

CUSTOMS SIMPLIFICATION ACT TAKES EFFECT: By its terms the Customs Simplification Act of 1953 is effective on and after September 7, 1953, with certain minor exceptions, a September 9 release from the Treasury Department states. In order to avoid any questions of the operation of the new provisions on and after the effective date, and to minimize possible confusion and uncertainty with respect to the application of those provisions, it was necessary to publish these Regulations as near the effective date of the Simplification Act as possible.

The acting Commissioner of Customs announced on September 9 the issuance of amendments to the Customs Regulations required to conform to changes in the law resulting from the enactment of the Customs Simplification Act of 1953, approved August 8, 1953. These Regulations were filed with the Federal Register on September 4, 1953, and appear in the September 9 issue. This action assures the public that there will be no delay in putting into effect the many improvements and clarifications of the Simplification Act.

Redesignations and amendments of the customs regulations appeared in the September 9, 1953, Federal Register.



NORWEGIAN BRISLING FROM FROZEN SARDINES

Tests were carried out in Norway on brisling sardines that were frozen, stored for 3 to 11 weeks at temperatures varying from -9°F. to -31°F. , and then canned. Results showed that the canned products prepared from frozen fish stored at -22°F. to -31°F. were as good in quality as canned brislings packed from fresh fish. Frozen brislings stored at higher temperatures did not make a good canned product.

--World Refrigeration, February 1953

FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

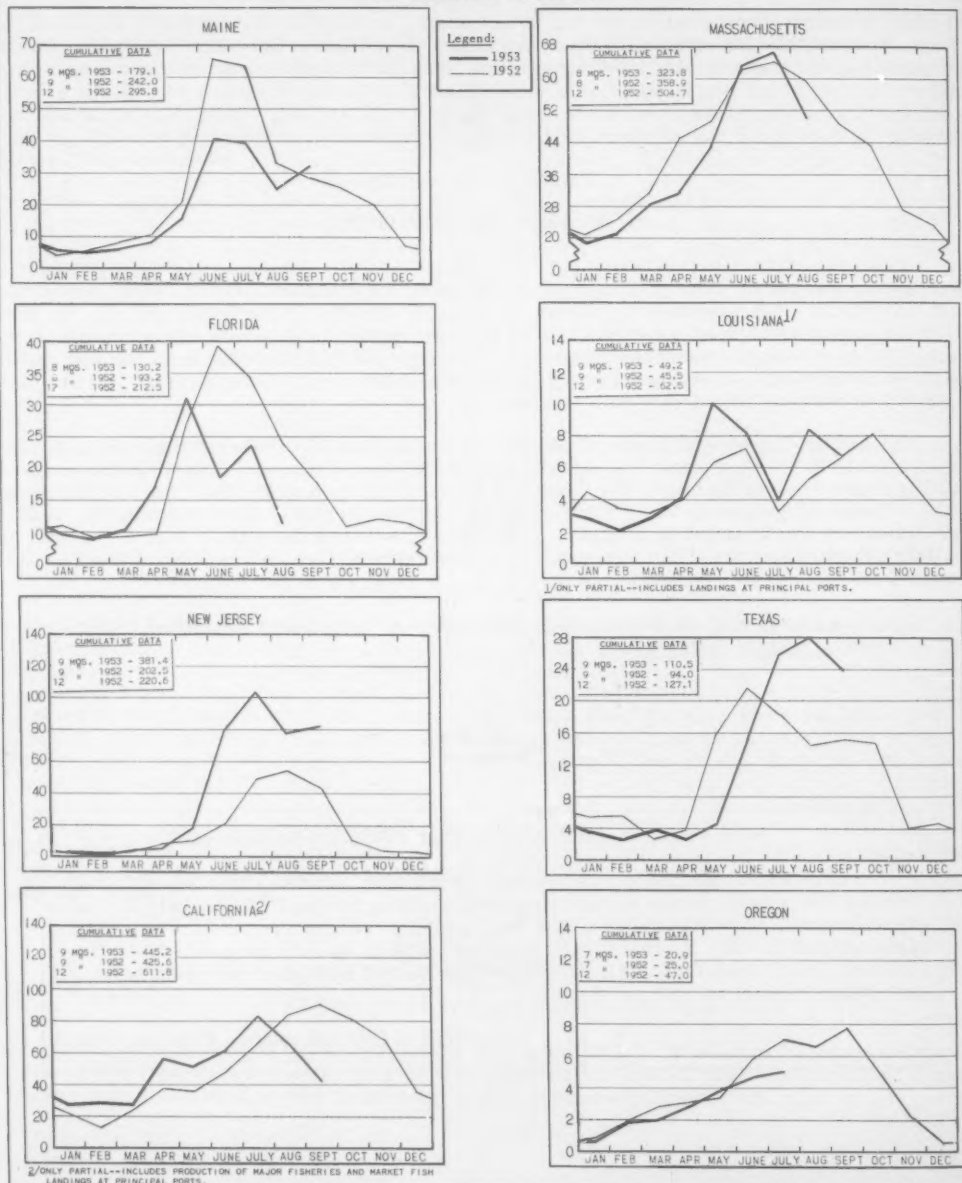
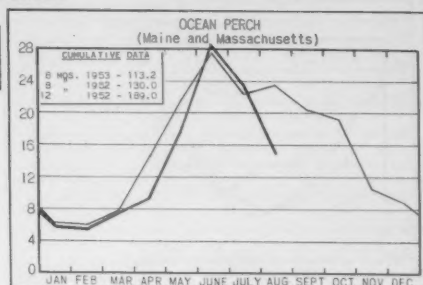
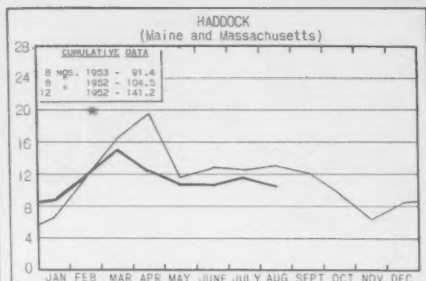
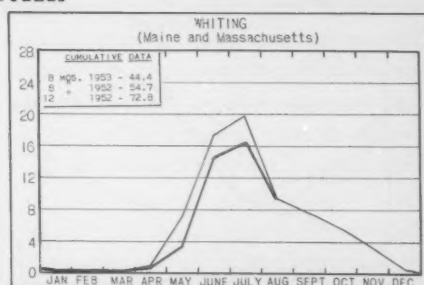
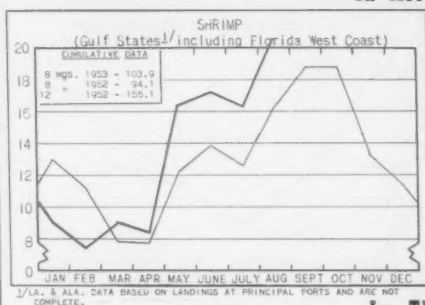


CHART 2 - LANDINGS for SELECTED FISHERIES

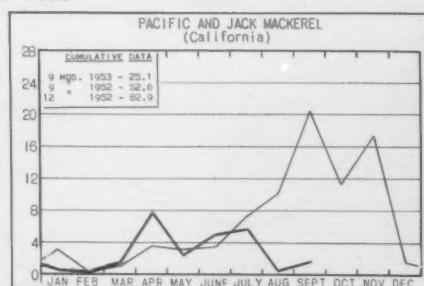
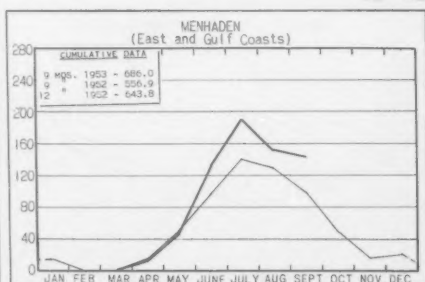
In Millions of Pounds



In Millions of Pounds



In Thousands of Tons



In Thousands of Tons

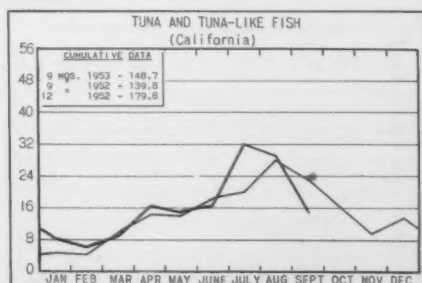
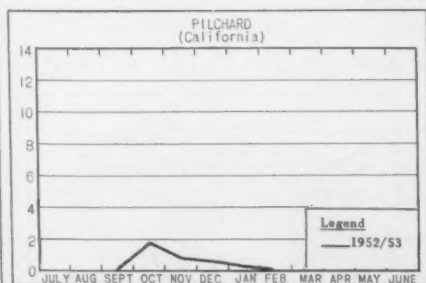
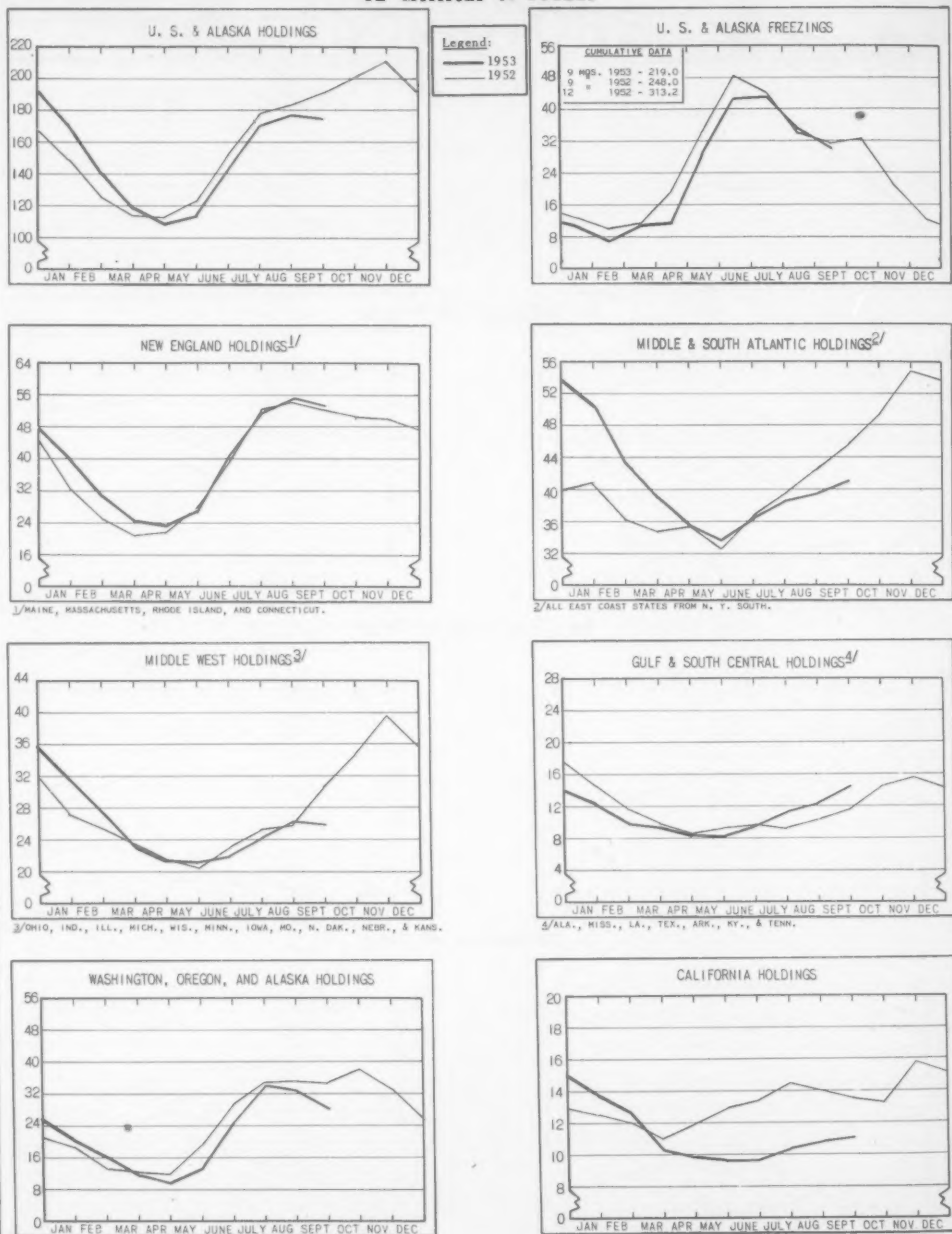


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

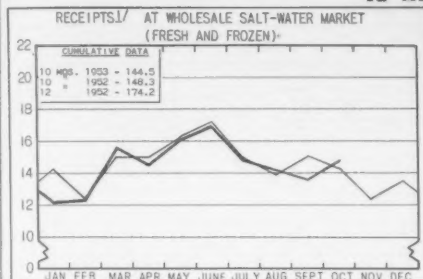
In Millions of Pounds



*Excludes salted, cured, and smoked products.

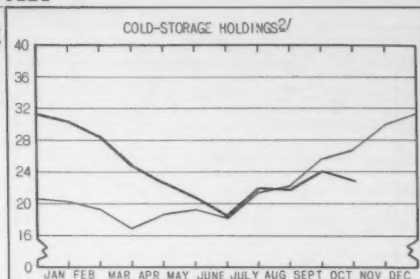
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pound

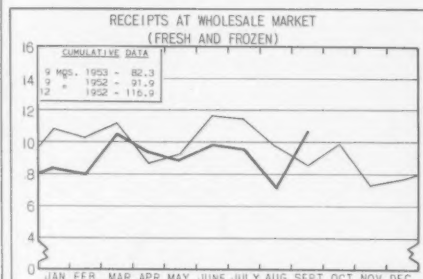


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

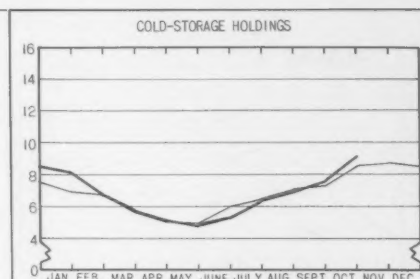
NEW YORK CITY



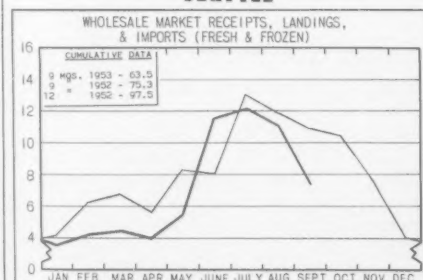
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



SEATTLE



Legend

— 1953
- - 1952

BOSTON

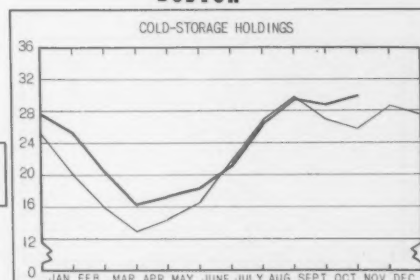


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

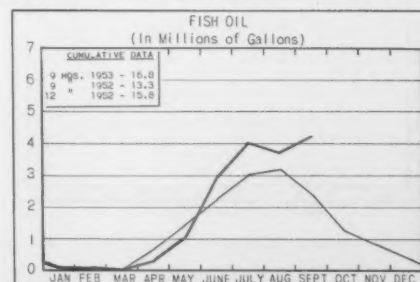
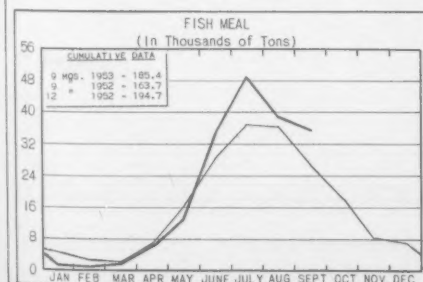
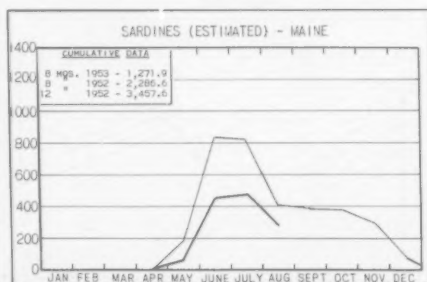
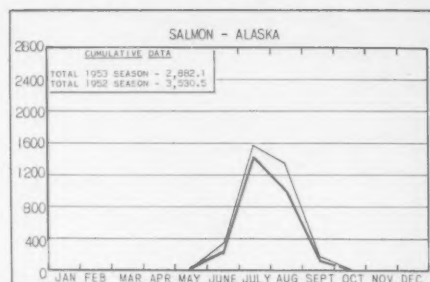
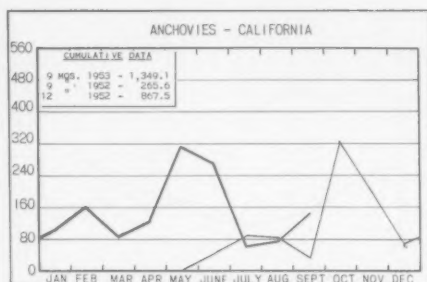
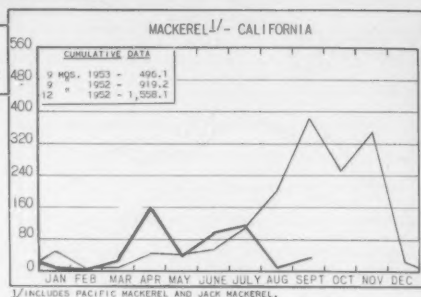
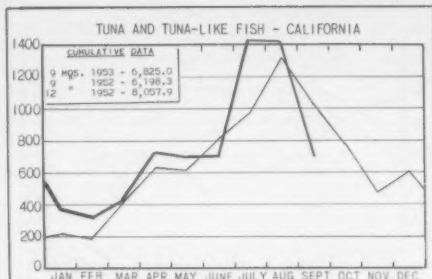


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP	48	—	5 oz.
TUNA	48	No. $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	$\frac{1}{2}$ lb.	8 oz.

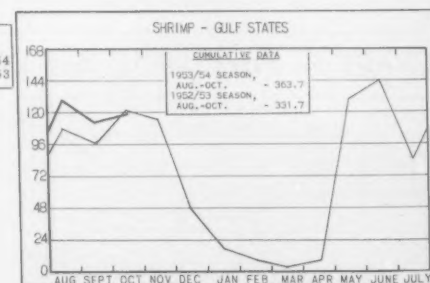
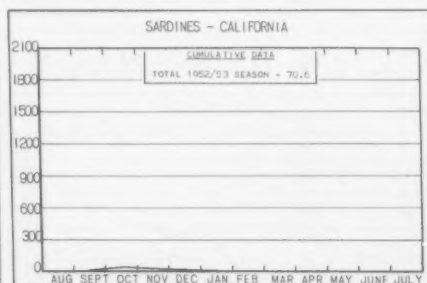
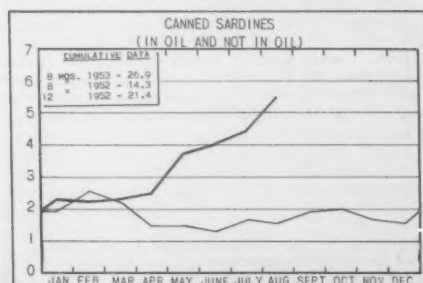
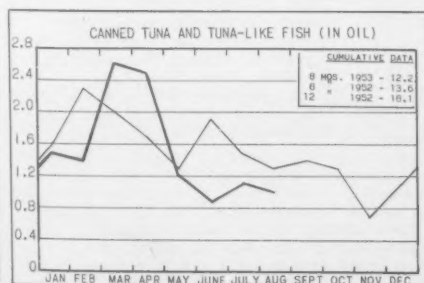
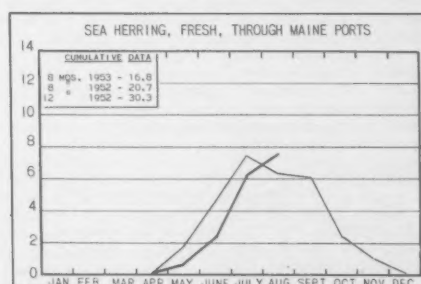
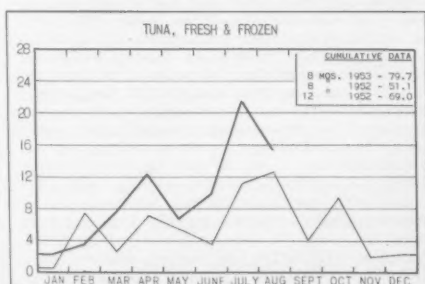
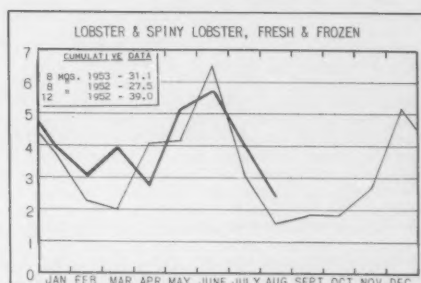
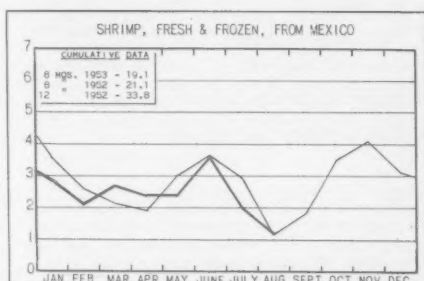
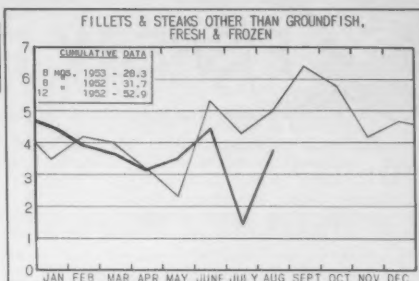
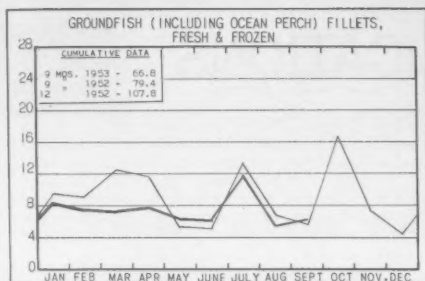
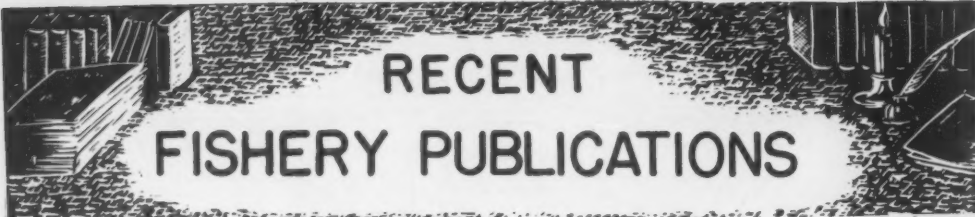


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

Recent publications of interest to the commercial fishing industry are listed below.

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.

FL - FISHERY LEAFLETS.

SSR,-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

SEP.-SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|---------|--|
| CFS-903 | - Massachusetts Landings, 1952 Annual Summary, 16 p. |
| CFS-912 | - Massachusetts Landings, June 1953, 8 p. |
| CFS-915 | - Fisheries of the United States and Alaska, 1951 Annual Summary, 16 p. |
| CFS-917 | - Frozen Fish Report, September 1953, 8 p. |
| CFS-920 | - Fish Meal and Oil, August 1953, 2 p. |
| CFS-921 | - Florida Landings, July 1953, 6 p. |
| CFS-922 | - Texas Landings, August 1953, 3 p. |
| CFS-923 | - Massachusetts Landings, July 1953, 8 p. |
| CFS-925 | - Mississippi Landings, August 1953, 2 p. |
| CFS-926 | - New Jersey Landings, August 1953, 2 p. |
| CFS-927 | - Maine Landings, August 1953, 6 p. |
| CFS-929 | - Florida Landings, August 1953, 6 p. |
| FL-336r | - Quarterly Outlook for Marketing Fishery Products, October-December 1953, 40 p. |
| FL-405 | - Salmon Cannery Waste for Mink Feed, by James R. Leekley, Raymond G. Landgraf, Jr., Jeanne E. Bjork, and William A. Hagevig, 31 p., illus. (November 1952). Gives results of co-operative work between the U. S. Department of Agriculture Experimental Fur Station, Petersburg, Alaska, and the U. S. Department of the Interior Fishery Products Laboratory, Ketchikan, Alaska, on the value of salmon waste for mink feed. Other fishery products, such as flounders (stomach and intestines removed) halibut heads, and rockfish were tested for comparison. Data on proximate composition, and niacin, biotin, |

thiamin, and riboflavin content of the various test rations used are presented. The results indicated that: (1) frozen pink-salmon cannery waste shows considerable promise as the main protein portion of the ranch mink diet; (2) both adult and kit mink (3 months or older) made better weight gains when fed raw frozen salmon waste than when fed any of the other fish products tested (processed pink-salmon waste, frozen flounders, frozen pink-salmon heads, frozen red rockfish, frozen whole pink salmon, frozen ling cod, and frozen halibut heads); (3) frozen raw pink-salmon waste is a more satisfactory protein ingredient than the processed waste when used for feeding female mink during the breeding and gestation period up to the weaning of the young; and (4) subject to further tests, the authors are unable to recommend feeding pink-salmon waste to young mink approximately 1 to 3 months of age.

- Sep. No. 358 - Tuna Fishing at Tahiti.
 Sep. No. 359 - Deep-water Trawling Survey off the Oregon and Washington Coasts (Aug. 25-Oct. 3, 1952).
 Sep. No. 360 - Progress on Fishery Technological Research Projects, Fiscal Year 1953. Program for Fishery Technological Research, Fiscal Year 1954. Reports Published During Fiscal Year 1953 on Specific Phases of Fishery Technological Research.



MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

Canadian Shellfish for Everyday Meals, Consumer Bulletin No. 6, 14 p., printed. Department of Fisheries, Ottawa, Canada. Recipes for a number of dishes using lobsters, crabs, shrimp, oysters, scallops, and clams are given. The recipes have been tested and approved by the Canadian Department of Fisheries' Home Economics Section. A paragraph under each type of shellfish outlines how each species is purchased and the quantities required for serving meals for the family.

East African Fisheries Research Organization Annual Report, 1952, 45 p., printed. East African Fisheries Research Organization, P. O. Box 343, Jinja, Uganda, 1952. Discusses the factors which determine fertility in tropical lakes; hydrology of the Buvuma Channel; hydrological data from swamps; diatom flora of the East African lakes; entomology (especially the species of insects that live in the mud and upon which certain fish feed); mollusca (aquatic snails); the fish which live in tropical waters; crocodiles; and fish-eating birds.

Economic Values of Anadromous Fishes in Oregon River, processed, 28 p. Legislature of the State of Oregon, Salem, Oregon, October 28, 1952. This is another in what is becoming to be a long series of estimates of economic values of fishery resources in local, state, and national areas. The present report is in response to House Joint Resolution 17 of the Forty-sixth Legislative Assembly of the State of Oregon, Chapter 590, Oregon Laws of 1951. This Resolution created an Interim Committee to make a study of the economic values of anadromous fishes in the rivers of the State of Oregon. Commercial and sport fisheries for anadromous fishes are included in the estimates of economic values which are for 1951. With respect to the commercial fisheries, estimates are given for such items as net income to State (from outside sources), sale of anadromous fisheries products within the State, etc.; and with respect to the sport fishery, for such items as expenditures of anglers and value of their equipment. Conservative, sound, and scientific methodology is used to arrive at the estimates. Expenditure or income estimates are given and no attempt is made to consider capitalized values of income data.

—W. H. Stoltz

Fisheries Research Papers, vol. 1, no. 1, 48 p., illus., printed. Washington Department of Fisheries, Seattle, Wash., July 1953. Includes the following papers: "General Views on Fisheries Management Goals," by Robert J. Schoettler; "Stream Flow and Silver Salmon Production in Western Washington," by William A. Smoker; "Migrations of Silver Salmon on Puget Sound," by Hans M. Jensen; "Notes on the Pacific Ocean Perch," by Dayton L. Alverson; "Length-Weight Relationships of the Lingcod," by Henry O. Wendler; and "The Sport Fishery for Salmon on Puget Sound," by Richard T. Pressay.

Fiskeri-Beretning for Aret 1952, 252 p., illus., printed, in Danish with English resume. I Kommission Hos G. E. C. Gad, Copenhagen, Denmark, 1952. This report contains detailed statistics on the Danish fisheries for the year 1952. Included in the report are data on number of fishermen, number of fishing craft, value of fishing vessels, catch by species, landed value of the catch, resumes by fisheries, and imports and exports of fishery products. Also includes comparative names of fish and shellfish in Danish, Latin, English, Swedish, German, and French.

"Food from the Sea" by J. F. Weiss, article, Agricultural and Food Chemistry, vol. 1, no. 13 (Sept. 1953), pp. 822-28, illus. printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C. (Single copy 40 cents for members and 50 cents for nonmembers.) Despite evidences that human civilization originated along seashores and rivers where aquatic plants and animals were abundantly available, we now obtain a relatively small portion of our food from this rich potential source of supply. The factors for growth of marine plants and animals include all the essential mineral elements, larger quantities of dissolved carbon dioxide, and the sun's radiation to foster photosynthesis. The food chain of the sea utilizing these essentials begins with the microscopic plants (phytoplankton) fed upon by minute animals (zooplankton), in turn eaten by the tiny shrimp-like copepods, the principal member of the crustaceans. Next in the chain are the small schooling fishes like herring, menhaden, mackerel, which become food for the larger cod, salmon, tuna, and shark.

The efficiency in the use of the food and energy value originating in the phytoplankton via this chain is very low—of the order of one ten-thousandth part—when the cod, for example, is ultimately used for man's food. In addition, an estimated nine-tenths of the total phytoplankton production is lost as a potential source since this amount is not consumed by the sea animals that eventually become human food. As a basis for more direct use of these microscopic forms, the average composition of the dry substance of the zooplankton is reported as: 99 percent protein, 7 percent fat, 20 percent carbohydrate, 1.7 percent chitin, and 9.4 percent ash. At present the cost of harvesting and extraction is too high to permit the suggested use as an animal food source.

Recent discoveries of enormous quantities of the large and more massive accumulations of the small crustaceans in what is known as the sound scattering layer are cited as offering a second potential source of nutritive materials. Other non-utilized sea forms listed include the 3,000 species of sponges that could be converted to food, feedstuffs, and fertilizer.

Examples of more extensive use of the higher forms of sea animals are recently-discovered lobster and red crab grounds about 100 miles offshore

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

from Cape Cod, and the ocean quahog and the sea mussel fisheries exploited as a result of World War II food needs.

Attention is called to: (1) the relatively undeveloped state of fishing and fishery products preservation in comparison to advances in other industrial fields; (2) the small portion of the whole fish now used for food; (3) the recent but still incomplete application of efficient conversion of fish wastes into animal feedstuffs. The proposed uses for fishery products are: (1) as fish flour to combat malignant malnutritional diseases in protein deficient tropical areas; (2) the low-temperature high-vacuum dehydration of fish to supply a less expensive but nutritive product at points where fresh fish is not available; (3) the wider use of enzymatic digestion to convert fish into fish pastes or sauces, or the fish wastes into valuable feedstuffs supplements and fertilizers. As examples of better utilization of fishery resources, the article cites the potential of pond and brackish-water fish culture and the edible meat of whales not now consumed.

Aside from the need for a more complete harvest of the sea's potential bounty and a more efficient use of the fishery products when harvested, the article lists as the most pressing problems to fuller sea resources utilization: (1) better distribution methods for the very perishable products; (2) improvement in purchasing power and living standards of backward nations; (3) facilitation of free flow of commodities between nations.

—Charles Butler

(India) The Rao Plan: Deep Sea Fishing as a Cottage Industry, Fishery Series—I, II & III, by U. Shanker Rao, 102 p., illus., printed. B. P. M. Syndicate, 37 Monokarpukur Road, P. O. Rash Behari Avenue, Calcutta 29, India. This book, which describes a plan for the development of the coastal fishing industry in India, is divided into three sections. Part I covers a brief survey of the commercial possibilities for the development of deep-sea fishing in India. Part II describes a scheme for the construction and chartering of standardized motor fishing vessels. Part III offers suggestions for a long-term Indian coastal fish survey to be carried out with the voluntary assistance of merchant ships trading in Indian waters, and a short-term immediate survey of certain selected areas of the coastal waters, estuarine river mouths, and the Sunderbans.

(North Carolina) Fourteenth Biennial Report 1950-1952, 120 p., illus., printed. North Carolina Department of Conservation and Development, Raleigh, N. C., 1952. A report of the North Carolina Department of Conservation and Development for the biennium July 1, 1950-June 30, 1952. It describes the work of the various divisions

of the Department, including the Division of Commercial Fisheries. This section discusses briefly the progress of the oyster program and the catch and value of various fishery products. A chart on the development of State agencies administering natural resources in North Carolina and an organization chart of the Department of Conservation and Development are included.

The Production of Halibut Eggs on the Cape St. James Spawning Bank off the Coast of British Columbia, 1935-1946, by Richard Van Cleve and Allyn H. Seymour, Report of the International Fisheries Commission No. 19, 44 p., illus., printed. International Fisheries Commission, Seattle, Wash., 1953. This report covers an investigation of the halibut egg production off Cape St. James, describing specifically the region sampled, method of sampling, spawning season, distribution of the halibut eggs, production of eggs on the Cape St. James grounds, correlation of egg production with other measures of abundance, and comparison of mortality rates on Cape St. James and Goose Island banks. An appendix contains discussions on the accuracy of sampling, method of analysis of the data, variability of egg populations, rate of development of the ova, rate of mortality of halibut eggs, and relation of depth distribution of ova to water density.

Regulation and Investigation of the Pacific Halibut Fishery in 1952, Report of the International Fisheries Commission No. 20, 22 p., illus., printed. International Fisheries Commission, Seattle, Wash., 1953. A brief review of the Commission's administrative and investigational activities in 1952 with reference to the Pacific Coast halibut fishery. In 1952 the Commission completed its twenty-first year of regulation of the halibut fishery and continued the statistical and biological investigations which form the basis for the regulations and a guide to future control of the fishery. Also presented are the 1952 regulations, statistics of the fishery, abundance of halibut in Areas 2A and 3A, the fishery in the special small areas, size and age composition of catches, and the tagging program.

TRADE LIST

The Commercial Intelligence Branch, Office of International Trade, U. S. Department of Commerce, has published the following mimeographed trade list. Copies of this list may be obtained by firms in the United States from that Office or from Department of Commerce field offices at \$1.00 per list:

Canneries - The Netherlands, 17 p. (August 1953). Includes fishery products canneries. The report also points out: "The fish canning industry of little importance prior to the last war, has vigorously expanded since 1945." The name and address of each cannery, relative size, and the products canned are given.



CONTENTS, CONTINUED

	PAGE		PAGE
FOREIGN (CONTD.):		FEDERAL ACTIONS:	54
JAPAN (CONTD.):		DEPARTMENT OF AGRICULTURE:	
EXPORTS OF FISHERY PRODUCTS, JANUARY-JUNE 1953	45	U. S. NOMINEE FOR DIRECTOR-GENERAL OF FAO	54
TUNA MOTHERSHIP EXPEDITIONS	46	CIVIL SERVICE COMMISSION:	
SHRIMP FISHING OFF CENTRAL AMERICA ...	47	FISHERY MARKETING SPECIALIST EXAMINATION ANNOUNCED	54
FISHERIES LAW AMENDED	47	DEPARTMENT OF COMMERCE:	
MALAYA:		BUREAU OF FOREIGN COMMERCE ESTABLISHED	54
SHRIMP FISHING	48	TREASURY DEPARTMENT:	
NORWAY:		BUREAU OF CUSTOMS:	
MEAL PLANTS INSTALL EQUIPMENT FOR FISH SOLUBLES	48	CUSTOMS SIMPLIFICATION ACT TAKES EFFECT	55
SOMALIA:		FISHERY INDICATORS:	56
FAO TEAM DEMONSTRATES TUNA FISHING METHODS	48	CHART 1 - FISHERY LANDINGS FOR SELECTED STATES	56
SPAIN:		CHART 2 - LANDINGS FOR SELECTED FISHERIES	57
MORE FISH CANNERIES ESTABLISHED	49	CHART 3 - COLD STORAGE HOLDINGS AND FREEZINGS OF FISHERY PRODUCTS	58
CRISIS IN THE FISHING INDUSTRY	50	CHART 4 - RECEIPTS AND COLD-STORAGE HOLDINGS OF FISHERY PRODUCTS AND PRINCIPAL DISTRIBUTION CENTERS	59
SPANISH MOROCCO:		CHART 5 - FISH MEAL AND OIL PRODUCTION, UNITED STATES AND ALASKA	59
CANNED AND SALTED FISH PRODUCTION, 1952	50	CHART 6 - CANNED PACKS OF SELECTED FISHERY PRODUCTS	60
SWEDEN:		CHART 7 - U. S. FISHERY PRODUCTS IMPORTS	61
EXPORT OF ELECTRICAL TUNA-FISHING UNITS PLANNED	50	RECENT FISHERY PUBLICATIONS:	62
FILLET PRODUCTION, 1952	51	FISH AND WILDLIFE SERVICE PUBLICATIONS	62
FILLET EXPORTS, 1949-51	51	MISCELLANEOUS PUBLICATIONS	63
UNITED KINGDOM:			
NEW METHODS DEVELOPED FOR QUICK-FREEZING FISH AT SEA	51		
COD-FISHING TRAWLERS USING LARGER-MESH NETS IN BARENTS SEA	51		
BRITISH-FRENCH SHRIMP FISHING DISPUTE	52		
VENEZUELA:			
FISHERIES REVIEW, 1952	52		
FISH BUYERS SEEK FIXED PRICES	53		



Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Betty Coakley, Alma Greene, & Kathlyn Brophy

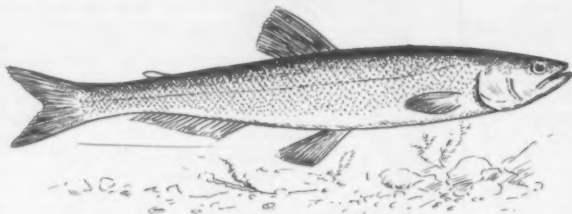
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Page 42--Comite National de Propagande pour la Consommation du Poisson.

COMMON NAMES OF ALASKA'S COMMERCIAL FISH AND SHELLFISH

Fishery Leaflet 413, Common or Local Names of Commercial Fish and Shellfish of Alaska, is a 4-page bulletin listing the names given each species of Alaska fish so that reference will provide producers and distributors with a common denominator of understanding regarding each species.

Many species of Alaskan fish are known by different names in different localities. In some instances, the same fish may be known by several names in the same locality. This confusion of common names often creates problems in the orderly marketing of Alaskan fish both in Alaska and in the continental United States.



EULACHON (*THALEICHTHYS PACIFICUS*). OTHER NAMES: HOOLIGAN, OOLIGAN, SMELT, CANDLEFISH, AND NEEDLEFISH.

would be even more confused if suddenly the Latin rather than the common or English names were used in the markets.

One of the long-range major objectives of the U. S. Fish and Wildlife Service is to standardize, as much as possible, the many local names now in use for American fish.

The list of suggested common names has been checked against various published papers on the fisheries of the Pacific Coast. In addition, it has been reviewed by personnel of the Service and the Alaska Department of Fisheries.

Copies of Fishery Leaflet 413 may be obtained free upon request from the U. S. Fish and Wildlife Service, Washington 25, D. C.

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